The Iron Age

A Review of the Hardware and Metal Trades.

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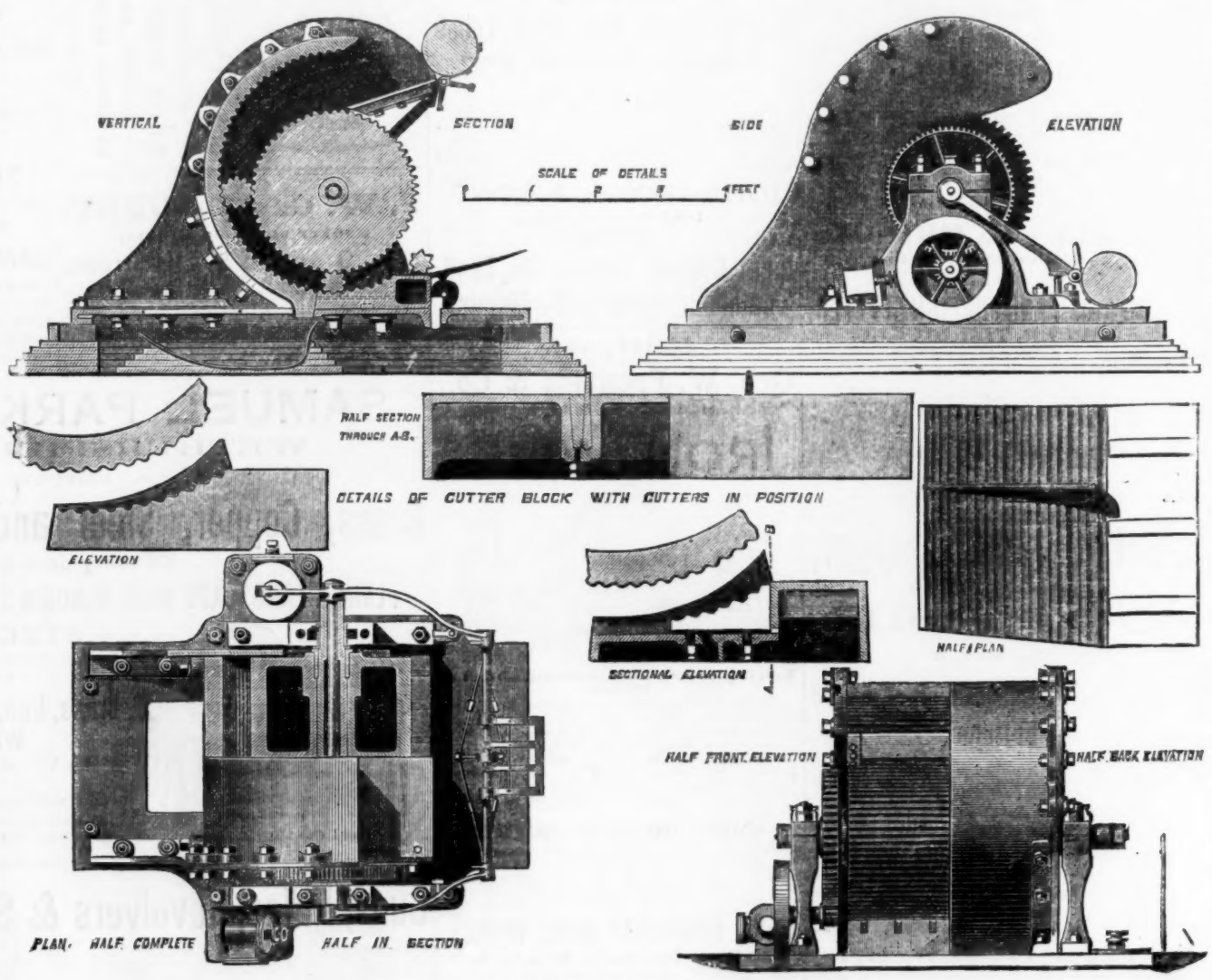
Combined Squeezer and Bloom Divider for the Danks Furnace.

The combined squeezer and bloom divider which we illustrate this week has been designed with a view to reducing the labor incident to the Danks system of rotary puddling, and facilitating the conversion of the Danks bloom or ball into different descriptions of finished iron. The ball or bloom as it comes from the Danks puddling furnace is a huge mass of 10 or 12 cwt., and it cannot be manipulated in the same way as the ordinary bloom, which only weighs 3 cwt. or 4 cwt. Mr. Danks himself has devised a huge squeezer, the cam of which weighs some twenty or more tons, for the purpose of shingling the blooms taken from his puddling machine; but this contrivance is not adapted for lessening the weight of the bloom, which has afterward to be removed direct to the roll and rolled off into strips of great length.

At the Carlton Works of the North of England Industrial Iron and Coal Company a set of very heavy rolls on a new principle, patented by Mr. Kirk, of Workington, has had to be made specially for this purpose; and at the Erimus Iron Works, near Middlesbrough, where the Danks system is also in operation, the bloom is brought from the squeezer—after being compressed under the cam—to a guillotine hammer, where a piece of iron of the length required for any particular purpose is cut off. In the first case it is not only necessary to lay down very heavy and expensive machinery, but a 30 in. mill like that at Carlton is not adapted for cutting up the iron so as to adapt it for guide or merchant mills. In the other case there is obviously a great deal of labor and of time employed in removing the bloom from the squeezer to a guillotine hammer, to be there cut up into such lengths as may be required. It is the purpose of the combined squeezer and bloom divider of Messrs. Robson, Coley, Price & Co., to get rid of all the disadvantages attendant on both of these plans. The bloom is here brought direct from the puddling furnace, and in passing through the squeezer, which is a large cam working within a case or envelope, it is brought down to whatever section may be necessary. It is then dropped on to what is called the cutter block underneath the squeezer, where provision is made by the use of removable cutters for dividing the bloom into as many pieces as may be required. Thus, in dealing with a ball of 10 cwt., the machine will give ten blooms of 1 cwt. each, or four blooms of 2½ cwt. each, or one bloom of 5 cwt., and five blooms of 1 cwt., to suit the requirements of the mills. All this is done without any loss of time or application of manual labor, other than that necessary to shift the cutters, and fix them according to the sizes of bloom required. Should slab iron be wanted for the tops and bottoms of railway bars, it would be necessary to take a bloom to the hammer and have it flattened; but smaller blooms of, say, 1 cwt. each, would fall from the cutters on to a bogey, in which it would be carried direct to the rolls. The cutting block, being in two parts, is readily changed. Our illustration is sufficiently descriptive of the machine, which is simply a revolving cylinder working horizontally. Gearing is applied to the shaft, which enables the bloom to be tilted into the squeezer without difficulty.



COMBINED SQUEEZER AND BLOOM DIVIDER FOR THE DANKS FURNACE.

The Metal Manufactures of Syracuse.

AGRICULTURAL MACHINERY.

Two large manufactories of mowing machinery, etc., are located in Syracuse, those of the Bradley Manufacturing Company and the Williams Mower and Reaper Company.

The works of the Bradley Manufacturing Company cover about four acres of ground, and front on four streets, viz., Marcellus, Fayette, Wyoming and Niagara. They occupy portions of two blocks, and the second stories of both buildings are connected by a bridge across Marcellus street. A considerable portion of ground is used in storing the lumber employed in the manufacture. The building devoted to the iron portion of the business has a front of 295 ft., and its greatest depth is 156 ft. The machine shop occupies a portion of the lowest floor of this building, and measures 66 by 156 ft. The only noticeable feature in this part of the works is the presence of considerable improved machinery not always found in such shops. Among these are several Blaisdell drills and three tool lathes. Between the machine shop and the foundry, which also fronts on Marcellus street, are several smaller rooms, one of which is devoted to storage, another is the tumbling room, and another the blacksmith shop. The cleaning room contains four tumbling barrels. The foundry has a frontage of 70 ft. and a depth of 150 ft. It has two cupolas, which have been running during the winter from 10 to 12 tons per day. One of the cupolas is to be replaced by a larger one, and the size of the foundry will be increased. Some of the castings in a mowing machine are very complex, and require great skill. The bed of the cushioned hammer, manufactured by this concern, varies in weight from 500 lbs. to 3 tons. Above the machine shop is a wood shop of the same size. There being a great deal of wood work in agricultural machinery, the wood working apparatus used in its production must be correspondingly extensive. One line of shafting runs through the shop. At the end of this room is the pattern shop. A railway traverses the carpenter shop, and passes over the bridge before alluded to into the paint room in the building on the other side of the street. The latter is 90 by 113 ft. in dimensions. The floor above the paint shop is occupied as a store room, the one below it is a shipping room. In addition to these buildings are various outhouses, such as a store house for supplies, 30 by 150 ft., a stock room, a show room, etc.

The officers of the company claim that they have been busy since the first of December, and that they have during this interval kept 250 men employed on full time. In agricultural machinery their specialties are the American harvester, the Acme mower, a self-dumping sulky hay rake and a pulverizing cultivator. Their cushioned hammer is now quite well known. It is a helve hammer, and the power is applied through an adjustable broad steel eccentric and connected to yoke by an universal joint. The whole is regulated by a foot treadle running around the bed of the hammer in such a manner that the operator can stand in front or on either side. A gentle pressure of the foot brings a tightener in connection with the belt upon the pulley, and thus varies the stroke in proportion to the pressure applied. On removing the foot, the treadle flies up, bringing the break upon the balance wheel, stopping it instantly with the hammer up. It is adjustable in length of stroke, rapidity of motion, and weight and force of blow. The makers claim that all jar and concussion is obviated by the use of rubber cushions, and that the helve cannot break.

The peculiarities of the agricultural machinery may be briefly stated. The harvester is a self-raking reaper. The manufacturers claim that it will cut and gather up and clean into gavels tangled grain; that it is light, draws easy, and is simple in construction. It allows of a 5½ ft. swath, and the driver's seat rests on the hub of the wheel so that he may balance the machine when in operation; it also prevents side draft. The guide bar is made angular, of cold rolled iron. The cut of the machine is raised or lowered from one to fourteen inches by a chain winding with a wrench around a shaft. The main or drive wheel has seven inches face or tread, and the outer or grain wheel is about two feet in diameter; both are nearly in line with the cut. The rake arms and heads are straight, revolving from a disc or center of motion in such a manner as to perform the work of rake and reel in the same revolution. The guards are malleable and lined with hardened steel plates. The Acme mower is a single or changeable speed mower with the cutter bar in front and at the right of the machine. The machine is balanced when the cutter bar is elevated and takes the weight off from the horses neck. Every shaft has at least 12 in. bearing, and runs in self-adjusting boxes. The gearing is enclosed so as to be out of the way of dust. The inner end of the cutting apparatus rests on the main drive wheel, and is made to float on the surface of the ground by the use of a coil spring, doing away with lead or surface wheels, and the friction caused by dragging the bar. The holes in the cutter bar heads are bushed with cast steel. The bronze bushings or linings in the pitman head are bedded in thick rubber cushions to prevent elongation of holes in the different heads and crank shaft box, etc. The principal feature of the hay rake is that a lock lever holds the teeth firm to the ground in heavy or difficult raking, or leaves them loose as required for stubble or other light raking. The cultivator is designed mainly for pulverizing and loosening up the soil for leveling the surface and for tearing up thistle and other roots. Its principal feature is an adjustable lever, which raises the cultivator from the ground by means of shoes at the ends.

The Williams Mower and Reaper Company's Works are situated at the boundary of Syracuse, and close to Geddes. The company owns four acres, and their buildings cover the greater part of the property. The works consist of three principal buildings and several outhouses used as stock rooms. The machine shop occupies the greater part of the first floor of the principal building. Its dimensions are 100 by 75 ft. Here all mowers and reapers are tested by being driven with a belt for some time before leaving the shop. Two Nile's presses are found here. The largest lathe takes in a piece of work 15 ft. in length. The largest planer has an 8 ft. bed. The engine has 70 horse-power, and its stroke is 14½ by 30 inches. Its main pulley is 12 ft. in diameter. Adjoining this room is the cutting apparatus room, in which the knives are riveted to the cutting bars. A number of small rooms are ranged alongside of the machine shop; a store room, a grinding room containing two large grindstones and emery wheels; the blacksmith shop, containing, in addition to the usual furniture, a Shaw & Justice hammer for light work; a chipping room and a tumbling room.

The foundry measures 100 by 75 ft., and is a building by itself. It is a remarkably well constructed foundry, and is provided with windows in the roof and in the walls, so that the room is amply lighted. It has one cupola capable of melting 5 tons per day. Back of the machine shops is a narrow building used as a store room for extras, 75 ft long. Over the machine shop is a woodshop provided with a railway track which traverses the room and passes down an inclined plane into the lumber yard. There it runs on a turntable, by which connection is made with another track at right angles to the former, which runs out to the street. Lumber is thus easily conveyed from the yard into the wood shop. The wood shop has one line of shafting, and is well provided with machinery. The pattern room is at one end of this shop. The wood shop communicates with the paint shop, which is in another building, by means of a bridge over which passes the railway track to which we have before referred. The paint shop measures 75 by 40 ft., and is two stories high. It is connected with a storage and shipping house, 36 by 100 ft. in dimensions. An extra store house is in a separate building, and is used for storing goods when they are finished before shipping. The works are well provided with fire extinguishing apparatus. Three hundred feet of hose are kept in store on the lower floor, ready for use. In various parts of the building are placed Babcock's fire extinguishers. The pattern store room is a separate brick building at some distance from the rest. Considering the value of the contents of such a building this precaution is worthy the notice of other manufacturers.

The advantages claimed by the company for their mower and reaper may be thus stated. It has what is known as a center cut, the knives being on a line with the tread of the wheel. It has a changeable speed, either speed being available while the team is moving. The cutting apparatus is claimed to work equally well on rolling as on smooth ground; the cutting apparatus is so arranged as to work in any position of the cutting bar. It has a tilting arrangement for rocking the guards to pick up lodged grass or grain. It has a reel rake which works either periodically or can be controlled by the operator.

The Commerce of the Future.

The New York *Bulletin* says:

A German statistician has lately given a tabular view of the commercial movement of the world as shown in the export and import trade of nations. In some regions, as in Africa, it is difficult to make an estimate; but what is equally striking is the fact that while old commercial countries maintain their trade, new ones are dawning, as it were, into the activity of commercial day. On looking at the trade figures of half-civilized countries, we see in them the great key to the commerce of the future. The trade of some countries does not always grow in proportion to the superior intelligence and commercial spirit of their people, but oftener accordingas its natural productions are in demand by other people. This influences the export trade alone. The imports depend more on, first, the available exportable matter, and, secondly, the necessities of the people, or rather on their appreciation of the wants of civilized life. But here again calculations are often at fault, for it is not the people upon whom most dependence is placed that always turn out the best customers. Even in two peoples, like the Chinese and Japanese, there is a great difference in aptness or willingness to avail themselves of the results of progress. Social habits and ethnological consideration both enter as factors. The surprising development of such countries as Egypt shows us the probable impetus which will mark the trade of what may be called the undeveloped commercial regions of the world.

It is this very fact which will preserve such manufacturing countries as England from decline. Trade is only beginning with some lands, and their inhabitants are but just becoming acquainted with the products of civilization. Till such time as these new countries themselves begin to manufacture, they will doubtless be customers of Great Britain, Germany, France and America for such articles as each can sell cheapest. In the meantime, however, there is but little doubt that when once the barriers that separate China from the rest of the world are broken down, it will enter in the markets with all the advantages which its immense and skillful population will give it. In different kinds of manufacture it is more than probable it will completely shut out European competitors. Late travelers through China have not only been amazed at the progress the Chinese are making, but are filled with apprehension at the perspective.

Another revolution in the importing and exporting business is preparing, which may involve a complete transformation in banking and exchange. When the commercial relations of two countries are sufficiently regulated, exchanges will be made in products, and balances will be paid in orders on other countries, which will also represent so much value in merchandise. The regulating power will not be gold, or gold alone, but what coin can only represent—commodities. These commodities will be symbolized on paper, and the use of metallic currency, in consequence, will be proportionately diminished. Transactions will be made on samples, and the merchants of the future will be speculators in products, as our brokers are in railway shares. The spirit of the age is speculative, and the tendency beyond question is to monopoly and centralization. What changes commerce may undergo, it is difficult to determine, but it would seem to gravitate to an excited but peaceful contest with the world for its field of operators.

The Wyandotte Rolling Mills.—The capital of the Wyandotte Rolling Mill Company is $1,000,000, and when in full operation the works employ 600 men, and turn out per annum 3000 tons of bar iron, 25,000 tons of rails, 3000 tons plate iron, 1000 tons of chain, and 8000 tons of pig iron. Most of the sales are made in Illinois and Michigan. Sales are made in other States, and some have been made in California. The power employed to run the machinery is entirely steam, and the buildings, shops and furnaces cover six acres. The president of the company is Capt. E. B. Ward, of Detroit, who has long been identified with the leading business interests of the country. He has founded numerous manufacturing enterprises and institutions in various portions of the Northwest, and has contributed his full share toward developing and encouraging the different branches of industry.

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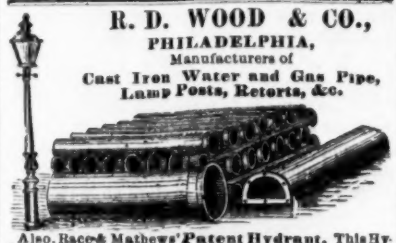

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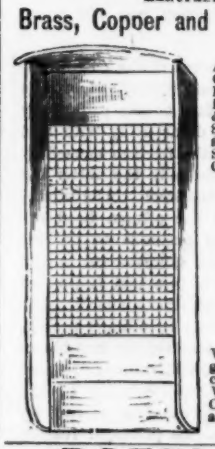

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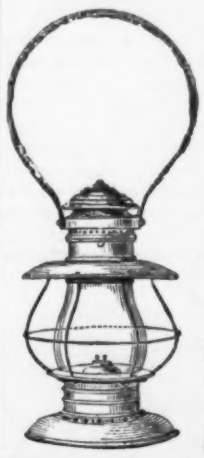

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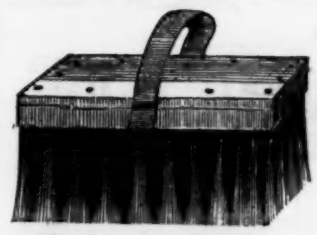

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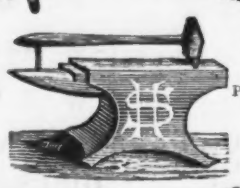

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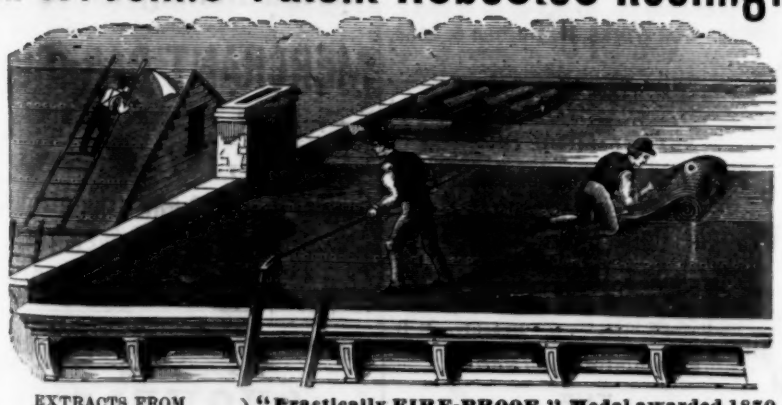

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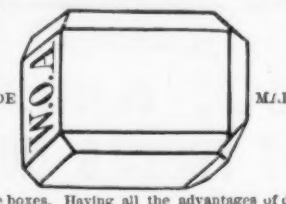

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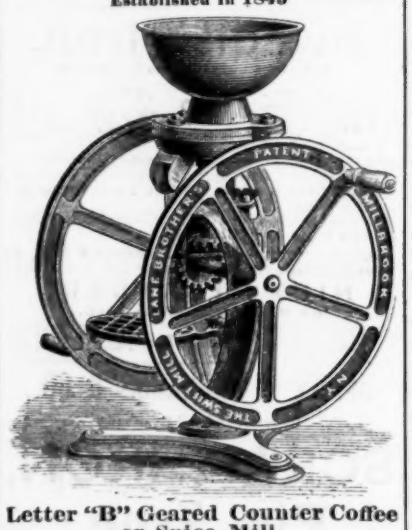

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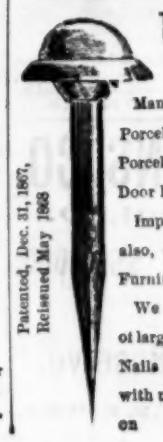

Patented, Dec. 31, 1867, Reissued May 1868

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Furnaces and their Construction and Management.*

* Abstract of a paper read before the Edinburgh and Leith Engineers' Society.

BY MR. CHARLES FAIRBAIRN.

Within the last two or three years a great change has taken place in the conditions under which our manufacturing supremacy has been maintained, and, whether we believe the unpalatable fact or not, there is not the slightest doubt that the sudden and rapid increase in the price of materials and labor has tended to place us more in a position of equality with competitors whom we were wont to overlook and depise. The change came too suddenly upon us, and has been too sweeping and arbitrary in so short a time, inasmuch, as the necessary improvements in labor-saving machinery and its introduction could not be attempted, far less completed, in substitution of manual labor and many expensive processes we have so long allowed ourselves to become habituated to. At the same time I believe that the revolution which has taken place will ultimately prove beneficial.

During a number of years I have been trying experiments with furnaces, with a view to the economy of fuel. As opportunity occured, the furnaces I experimented on have been of various kinds, but lately they have been what are known as reverberatory furnaces, chiefly used for puddling and reheating iron. Before entering upon a description of the furnace I found to answer my purpose best, I will briefly describe what a furnace should be, and how it should be constructed to answer all the conditions requisite for economy of fuel; and, secondly, our furnaces as at present constructed, and why they are so wasteful. The great variety of kinds of fuel, although they contain nearly the same ingredients, but in different proportions, renders it a somewhat difficult task to define what a furnace should be. Hydrocarbons, such as pitch, tar, naptha and petroleum, have all to pass into the gaseous state before they can be burned.

Coke, which is coal with all the bituminous and gaseous portions taken out of it, is nearly pure carbon with a small proportion of ash.

Anthracite coal, which is very similar in its nature to coke, is almost wholly composed of free carbon. It is liable to split and fall into powder, it burns without flame, and with very little smoke, and requires a very strong draught.

Bituminous coal, again, of which there is an immense variety, has a smaller proportion of carbon with a mixture of hydrogen and oxygen. From this it will appear evident that special provision must be made for a supply of air to support combustion instead of the different kinds of fuel used. Thus, a furnace arranged for burning bituminous coal might be very wasteful in burning anthracite coal; due regard, then, must be paid in all cases to the character of the fuel employed. The indispensable conditions attached to a good furnace for all kinds of fuel are: (1) A good draught which can be regulated at will, so as to avoid forcing the fire too much; (2) a large and roomy combustion chamber surrounded by fire bricks, and removed, if possible, from the place where the heat is to be used; (3) that the sides or walls of the furnace have at least two thicknesses of bricks nearest the fire, and an outer wall having an air space between of about three inches; (4) that the supply of air to the furnace can be regulated at will.

I do not think we can always command all these conditions, especially in a furnace constructed on the principle of depending on atmospheric pressure for draught; and the reason is obvious, because in order to maintain a good and equal draught we require not only a tall chimney, but the chimney must be maintained at a high temperature, about 600°; and as the temperature within the furnace may be assumed at 2500°, the abstraction of this large quantity of heat to keep the chimney at a sufficiently high temperature amounts to one-fourth of the heat, and consequently the fuel which is expended for this purpose alone. Nor is this the only drawback. The attendant on the furnace, who may, and often has other duties to perform, puts on a heavy load of coal. The flues and chimney are rapidly cooled, and the power of the draught reduced at the very time when it should be greatest. The second and third conditions mentioned may assist in getting over irregularity in the power of the draught to a certain extent—that is a large and roomy combustion chamber, and the sides constructed to prevent loss of heat. I do not suppose any person who has not had an opportunity of seeing a furnace in operation with the heat confined in the manner described could have believed the effect would be so powerful; the inner lining actually acquires a white heat, thus serving as an accumulator, which is given out again when the temperature of the fire is reduced (as in the case of a fresh charge of fuel), and at the same time assisting to bring the fresh fuel into active combustion more rapidly; the heat is again returned to the fire bricks, and kept ready for future use.

Doctor Siemens has taken advantage of this idea, although in quite a different way, in his celebrated gas furnace; and, as it has been very effective in economising fuel in very large iron manufacturing establishments, I will try and describe it briefly here. A close furnace is constructed entirely of fire brick, and capable of holding several tons of coal. The grate bars slope at an angle of 45°, so that the fuel as fast as it is consumed slides down on the top of the fire, making the furnace in a manner self-feeding. The fire is lighted from the bottom, and just enough air admitted to support a slow combustion. The small quantity of carbonic acid formed at the bars where the air gets free access is decomposed as it passes through the mass of incandescent fuel above, and taking up more carbon is converted into carbonic oxide. The products of combustion are carbonic oxide, hydrogen and oxygen. These products are passed on through a pipe into a furnace, receiving on their way the requisite quantity of air, and, becoming thoroughly mixed with it, are consumed in the furnace. The calorific effect of this furnace regarding the distribution of the heat developed has been investigated by Kraus, and may be condensed thus: Amount of heat expended in the first process, 31·7 per cent. of theoretical effect of complete combustion, that is in obtaining the gases. Thus, heat lost in the chimney and in transmission from the gas producing furnace to the gas consuming furnace is about 23·86 per cent., leaving 76·14 per cent. to be utilized. Again, taking into account the loss—if we may call it so—of 31·7 per cent. in producing the gas, the total duty of the coal used, 52 per cent. and 48 per cent. represents the loss. This appears a very large percentage of loss, but when we take into consideration the enormous loss in the ordinary furnace this almost seems trifling by comparison. Of course this estimate takes the total or theoretical heat as contained in the coal. The Siemens furnace requires great care in its management, and is said to be more useful for heating large masses of iron for forgings or long bars than for puddling or the intricate processes of iron manufacture.

Siemens' furnace, however suitable for large establishments where a great number of furnaces have to be supplied with gas, is clearly too cumbrous and costly for smaller places, and the question arises—can we not effect, approximately at least, a similar result in single furnaces to what is done by the Siemens' furnaces? I think so.

We will now consider our furnaces as at present constructed, and why they are so wasteful. We hear a great deal about thin fires and regular charges in the ordinary furnace; and this is quite correct, inasmuch as it is the only way by which a right supply of air can be introduced to mix with and consume the gases. There are always two dangers we have to avoid. One is too much air, which is the least of the evils, and in which case a very large body of air passes away unconsumed, but it also carries away with it a certain amount of heat which cools the furnace and impedes the draught. The other evil of too little air is still more injurious, for the gases having only a small share of the oxygen required are burned into carbonic oxide, and this very often accounts for the deficient supply of steam from a boiler in consideration of the coal burned. But these fires are liable to burn into holes and admit streams of cold air; nor is this the only objection, for when the fire is fed with fresh coal, which must of necessity be very often, the new coal absorbs a large proportion of the heat of a thin fire, and immediately lowers the temperature. The fire contains a certain number of units of heat. If twice the quantity of coal was in active combustion there would be double the number of units of heat, and it could, therefore, more easily sustain the reduction of temperature following a fresh charge of coal. I imagine the distillation of gas from coal or volatilization is a process similar to steam carrying off the heat from boiling water. The coal at first becomes an absorbent of the heat and then liberates the gases, and the volatilization of the bituminous portion of the coal acts in a similar manner to the production of steam, as I have said. The process is one of the most energetic known in cooling, because there is so large a portion of the heat converted from the sensible to the latent state. Regarding the quantity of air required in the ordinary furnace for the combustion of coal, I suppose very few people have any idea of the magnitude of the demand. It is generally given as 300 cubic feet, or 24 lb. of air to 1 lb. of coal. Let us place this in another light. In my own establishment in Gateshead I have seven furnaces, each of which uses about one ton of fuel per day, in all about seven tons; therefore 7 × 24 = 168 tons of air required. Again, a pound of coal requires about 300 cubic feet of air. If we imagine the 168 tons of air made into a long stream of one square foot in area, the total length will be 21,381 miles in length. Another great cause of the loss of heat, as before stated, is the quantity of heat continually passing away to the chimney.

(To be Continued.)

What is the Best Rail?

At the recent meeting of the Association of Civil Engineers, the committee on the manufacture of rails reported that the English system of rails, which requires great strength, is not applicable to this country, where endurance is the chief requisite. Strength is the first consideration where the wear is heavy; but where the wear is light, the rails should be as light as is safe. The greatest amount of metal should be at the head of the rail, where there is more wear; and the theory that a head 2¼ inches wide will endure more than one 3 inches wide, is erroneous. Low, wide rails are better than high, narrow ones, with the present heavy machinery. Rails might be made more rigid if the foundation were better and there were no frost; but, as it is, a moderately flexible rail is best. A square rail would be too flexible, and those with a stem and base are much better. It would even be advisable to put 60 per cent. of the metal in the head were it not for the fact that a double-headed rail wears out fast. The average wear of an iron rail is equal to a pressure of 4,000,000 tons dead weight, or 10,000,000 tons gross weight. The stone ballast of the American roads has been too large; and on a good road a rail would last fully 25 per cent. longer than on a bad one. In the absence of definite figures as to the comparative value of iron and steel, the committee were of the opinion that a steel rail was 20 per cent. better than a good iron rail, 40 per cent. better than a fair iron rail, and 100 per cent. superior to the ordinary rail used on many roads.

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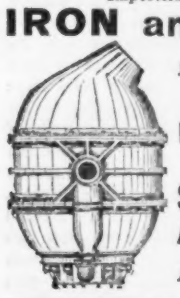
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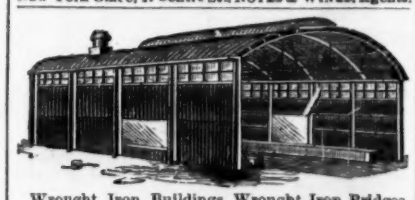
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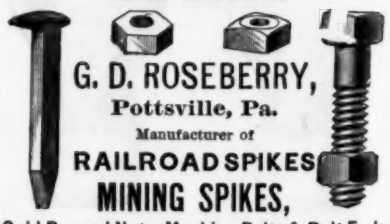
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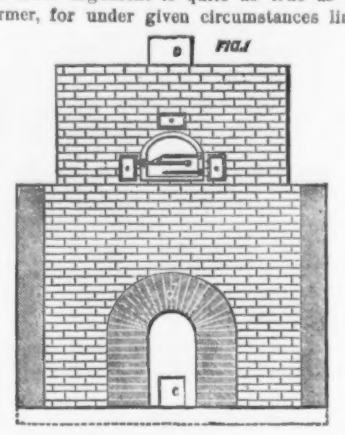
Heating with Limestone.

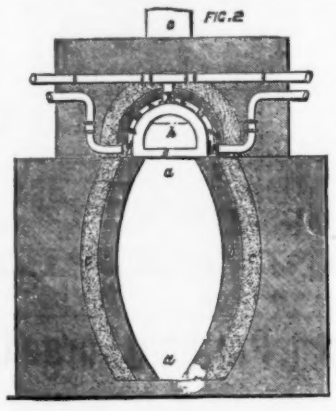
Not many months have elapsed since a vigorous controversy was carried on in the correspondence columns of the London *Times* as to the possibility of obtaining heat from the combustion—if we may use an apparently incorrect but certainly convenient term—of limestone. It was argued on the one hand that nothing could be had in this way from limestone, and it was asserted on the other, that, however true this might be in theory, in practice the use of limestone in combination with coal effected a saving of fuel; and no doubt the latter argument is quite as true as the former, for under given circumstances lime-



stone, if it does nothing else, does insure the perfect combustion of coal, and does prevent a loss of heat which would take place without it.

Mr. Cowan, of Dublin, has taken adventage of the fact, and produced the heating apparatus which we illustrate in the annexed engraving. The apparatus has now been at work for some time at various situations, and is being introduced into England by a company under the title of the Dromore Patent Heating Company, limited.

A large party of gentlemen interested in the heating of conservatories, houses, etc., lately visited the seat of Lord Salisbury, at Hatfield, to inspect the working of the apparatus, which heats about 7000 ft. of piping in the hothouse and vineries at Hatfield. The arrangement

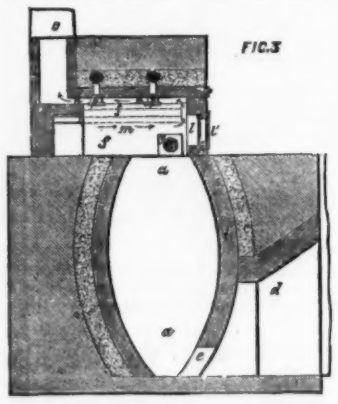


adopted is almost precisely that illustrated in the accompanying engravings.

Fig. 1 is an elevation of a lime kiln fitted at the top with a saddle boiler; *o* is the chimney, which may be from 10 ft. to 14 ft. high, according to the size of the apparatus; *l* is the door by which the kiln is fed; *c* is the place from which the lime is drawn.

Fig. 2 is a transverse and vertical section of the apparatus; *a* is the chamber of the lime kiln; *b* a lining of fire bricks; *c* a backing of sand to retain the heat; *f* the boiler placed over the mouth of the kiln; *m n* the flues round the boiler; *p* the flow pipes; *q* the return pipes.

Fig. 3 is a longitudinal section of the appar-



atus; *d* is an arched beam for giving access to the cleaning hole.

At Hatfield a poor chalk is the only form of limestone available. It is sandy and charged with much water. The kiln holds about eight tons of material at a time, and is usually charged and drawn twice in the twenty-four hours. The result was in every sense satisfactory, one-third of the ordinary quantity of coal sufficing to keep up the temperature of the houses to the proper heat, say 80°; while the lime produced paid for the cost of the coal.

We have no doubt that the system will be found applicable in very many instances where a perfectly uniform heat is required, and it is likely to give extremely good results in the case of large public buildings, such as hospitals and prisons.

New Patents.

IMPROVEMENT IN FURNACES FOR ROASTING ORES.

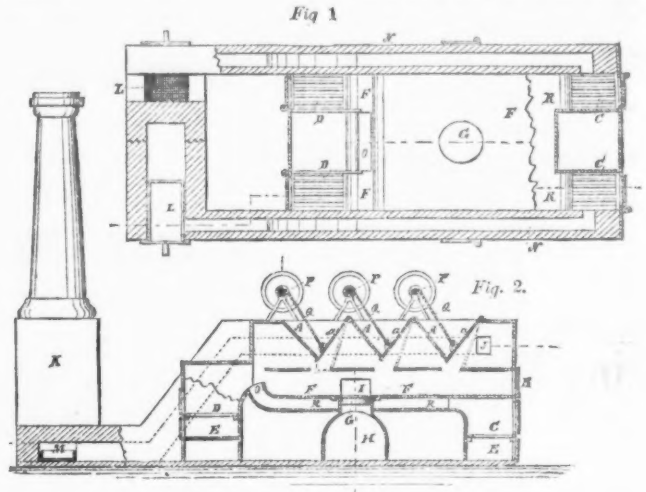
Specification forming part of Letters Patent No. 151,900, dated June 9, 1874; issued to Pentecost J. Mitchell, of Salt Lake City, Utah.

Fig. 1 is a horizontal section of the apparatus embodying my invention. Fig. 2 is a longitudinal section.

Similar letters of reference indicate corresponding parts.

An oven of rectangular structure is made of brick or other fire-proof material, of which N, N, are the side walls, and arranged thereon are hoppers A, of cast or wrought iron, with a movable side, *a*, to be opened or closed by means of a shaft, P, and chain Q. The ores or materials for calcination are placed within the hoppers, where they remain a few hours, when they are dropped through the action of the sliding doors upon the calcining floor F, F, which is constructed of cast iron plates supported upon brick flues R, R, through which the heat is conducted from the furnaces C, C, and returned over the working floor through the flue O, receiving an additional supply of heat from the furnaces D, D. The smoke and impure gases are carried off by the draft of the chimney K, K, K, through the flues J, J, and the condensers L, L, consisting of a showering or sprinkling apparatus, through which water is let fall, by which a portion of the escaping sulphur, arsenic, etc., are deposited in the pans M, M, and removed at pleasure. The ores or minerals in process of calcination are manipulated by workmen using hooks or rabbles for that purpose through the doors B, B, and I, I. When it is sufficiently prepared it is precipitated through the opening G, into cooling arch H, H, from which it is transported to reduction works. The letters E indicate the ash pits to the furnaces C, C and D, D.

Fig 1



IMPROVED ROASTING FURNACE.

The object of the invention is to expel, by means of heat, sulphur, arsenic, and other deleterious substances usually found in nature, associated and combined with ores of iron, silver, copper, lead, and other ores or minerals, by reason of which they are comparatively valueless until removed.

Claim—A desulphurizing oven comprising the adjustable hoppers A, floor F, flues R, O and J, furnaces C, D, and condensing apparatus L, M, combined and arranged substantially as specified.

IMPROVEMENT IN THE MANUFACTURE OF METALLIC FOIL.

Specification forming part of Letters Patent No. 152,180, dated June 16, 1874, issued to Wm. A. Shaw, of New York.

This invention relates to the manufacture of metallic foil, such as lead covered with tin. Such foil has heretofore been made by casting ingots of lead coated with tin and rolling them out together—a tedious and expensive process, and one in which there is much waste of material, from the difficulty of making the metals roll together without breaking or cracking.

Metals may be pressed out of a retaining vessel that would not admit of being rolled from their inferior ductility; and the object of this invention is to produce thin sheets or foil by such pressure.

To do this take a retaining vessel, made, by preference, oval in shape, with a plunger to correspond. This retaining vessel has a die with an opening along its longer axis of the width of the foil to be made, a construction analogous to that employed in apparatus for making sheet lead. Within this vessel is to be placed a series of wedge shaped ingots of lead, or its alloys, superimposed one upon another, with their points turned toward and lying in the plane of the die opening. Around these central ingots melted tin or its alloys is then poured, and when the whole has consolidated the mass is forced out through the die by pressure applied to the plunger. These wedge shaped ingots are to be so made and adjusted in size and shape as to insure a uniform product in thickness of lead and tin. There may be a number of additional equidistant openings distributed around the die to allow surplus tin to escape, and for the purpose of relieving the pressure necessary to be used. The product may then be carried between rollers should it be required to further reduce the thickness.

The retaining vessel for holding the charges of lead and tin can be made square or rectangular in shape, with a square or rectangular plunger fitted to it. There may, in this case, be a series of dies parallel to each other, and the charger may be made up of a number of tin ingots, each one inclosing lead, and placed side by side in the retaining vessel. On applying pressure to the plunger, there will be a number of sheets of foil, as many as there are die openings, formed at one operation. This arrangement will diminish the amount of pressure required to work the machine, and will allow the process to be conducted with more rapidity.

If desired, a fixed core may be placed within the retaining vessel, the plunger traveling around and over this core. The latter may be rectangular, oval, or other suitable shape, and be hollowed so as to allow a hot blast, or steam, or other heating medium to be supplied to the center of the charge; or cold water may in like manner be admitted, according to the nature of the material being operated upon. Another office of this case is to cause the metals composing the charge to issue uniformly and evenly from the die, even should they be formed into ingots or blocks with parallel sides.

The retaining apparatus may be heated or cooled in any suitable manner, as is well known and practiced in making metallic pipes.

The charges or ingots, in lieu of being cast in the retaining vessel, may be cast in molds and afterward placed in the retaining apparatus, and then pressed out therefrom in the form of sheets or foil, as above provided. The dies for forming the sheets, instead of being in the bottom of the retaining vessel, may be placed within the face of the plunger, which in this case must be made hollow for the escape of the material; or they may be placed in a suitable holder at the bottom of the retaining vessel. The latter may be stationary, and the pressure communicated to the plunger, or the ram or plunger may be stationary, and the pressure applied to the retaining vessel.

The dies through which the metal mass is forced are of any suitable construction; as, for instance, they may consist of rolls mounted in a frame, and bottom piece suitably adjusted to the digester or retaining vessel. These parallel rolls may be arranged so as to be set at different distances from each other to make sheets of different thicknesses. Two or more sets of such rolls may be placed, one in rear of the other, so that the metals pass through from one to the other. These rolls may be positively rotated by independent driving mechanism, if desired.

The ingots of metal can be cast in molds, so constructed as to form tongues and grooves on the faces of the ingots, which may thus be fitted and locked together, and afterward pressed out through the machine; or ingots prepared in this manner may be rolled by means of an ordinary rolling mill.

The foil thus produced is composed of a center of lead or its alloys with exterior lamine of tin or its alloys, the whole compressed and united in one solid leaf, free from the irregularities, imperfections and inequalities in the thickness of the lead and tin found in foil made in the ordinary way.

Claim.—The manufacture of metallic foil composed of two or more of the ductile metals, by pressing said metals simultaneously and together out from a retaining vessel or vessels through one or more die openings, substantially in the manner described, with or without a subsequent rolling of the compound sheet so formed.

IMPROVEMENT IN PRECIPITATING COPPER BY MEANS OF TIN SCRAP.

Specification forming part of Letters Patent No. 150,957, dated May 19, 1874, issued to T. Sterry Hunt, of Boston, Mass.:

This invention consists in using tin plate scrap or waste for the precipitation of copper from the solutions obtained in the various wet processes of copper extraction, and in saving in the operation the adhering tin. The copper solution must contain at the same time protochloride of copper (otherwise called cupric chloride) and sulphate of soda, or some other base. Such solutions are obtained from sulphureted copper ores which have been calcined with common salt, as in the Longmaid or Henderson process, or when similar ores after roasting are digested with chlorides of iron or other chlorides, as, for example, in the Hunt and Douglas patent process. In case, however, the solutions of copper to be precipitated contain no chlorides, add a portion of common salt, and in case they contain no sulphates, add a portion of sulphate of soda or other soluble sulphate. In either case, these salts may equal the amount of copper present. Such solutions, containing both chlorides and sulphates, especially if heated, as is usual in copper precipitation, very quickly dissolve the tin from tinned iron when this is immersed therein, and at once let it fall again as an insoluble hydrated oxide of tin, which may be readily drawn off while suspended in the liquid, and collected by subsidence in proper tanks, to be subsequently treated by methods known to chemists, such as dissolving in hydrochloric acid and precipitating by metallic zinc, by reduction in the dry way, or by conversion into stannate of soda. The scrap iron thus freed from tin is then employed in the ordinary way to precipitate the dissolved copper, as metallic or cement copper, from the solutions described. The copper solution holding the suspended oxide of tin may be drawn off at once from the iron to the settling tank, and a fresh solution added; or the precipitation of the copper may be carried on without interruption in the first solution till this is exhausted, and the oxide of tin afterward separated from the metallic copper by taking advantage of the greater lightness and the more finely divided state of the former. Should it be desirable to remove the tin from the iron plate without causing an immediate precipitation of copper thereon, this may be effected by mixing a solution of perchloride, or other persalt of iron, with the copper solution.

Claim—1. The use and application of tin plate scrap or waste for precipitating metallic copper from its solutions.

2. The recovery and utilization of the tin from the tin plate scrap by means of its solution and subsequent precipitation as oxide of tin in solutions containing protochloride of copper and a sulphate.

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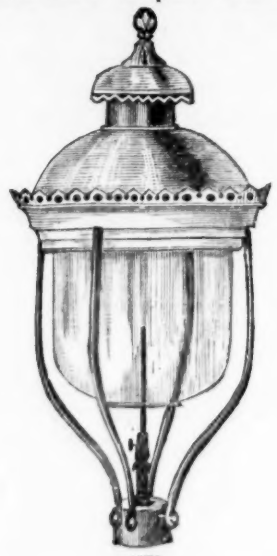

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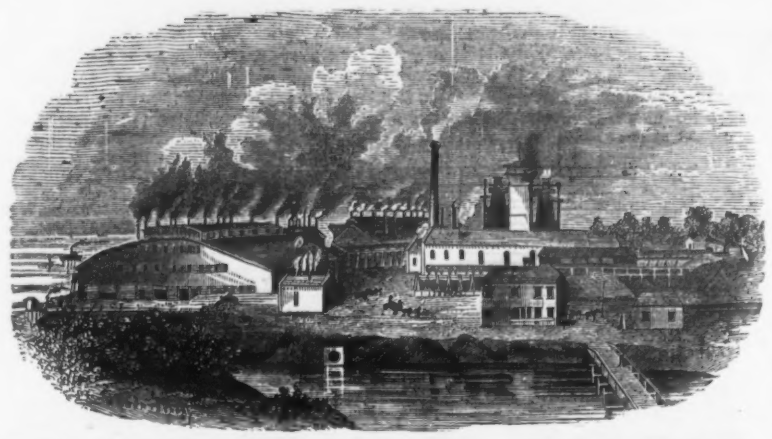

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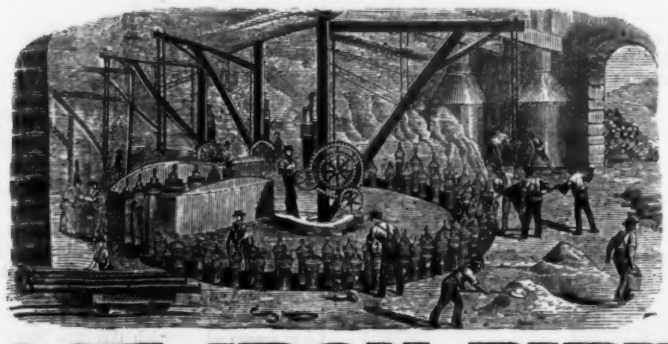

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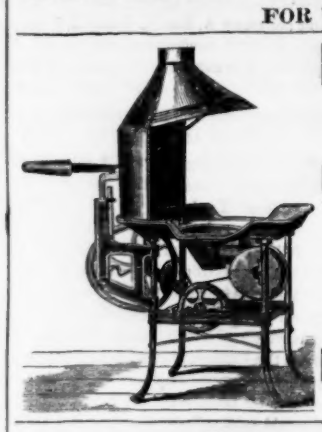

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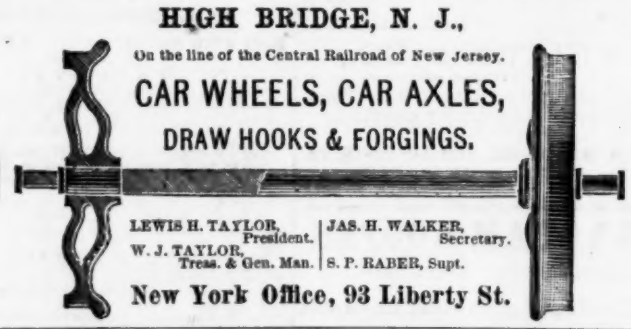

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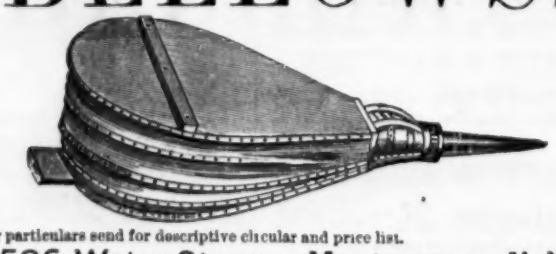

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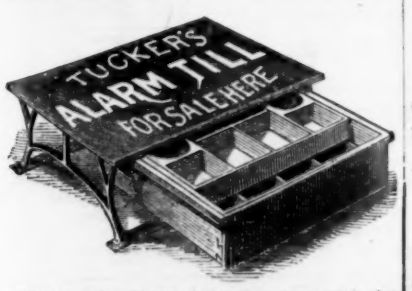

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Some Practical Observations on Puddling.

BY M. WOLTERS.

CHANGES OF NATURE WHICH MAY BE PRODUCED IN SLAG.

It is possible to change the composition of slag in different ways, with more or less success.

1. Principally by action of the flame. The art of the puddler, indeed, consists almost exclusively in good management of the furnace; he may cause the flame to be either oxidizing or carburizing. When he perceives that the fining takes place too rapidly; that is to say, that there is in the fluid an excess of ferric oxide, or that too much of it is forming, he will take care to have abundant reducing flame on the hearth; he will clear his fire, will let out the clinkers, and remove one or two bars, as may be necessary, in order that the slag may not become attached to these; he will charge the grate, distributing the fuel well over the whole surface, so as carefully to stop the interstices by which air might enter in large quantities without burning. He will thus obtain a reducing atmosphere of carbonic oxide, and of carburized gases.

If the refining takes place too slowly, and if the slag is thin, the puddler must try to obtain ferric oxide (more or less) by means of an oxidating current; he will allow some clinkers to form on the grate, and to effect this more easily he will put in one or two bars more, if that is required. Thus there will be less fuel on the grate, the fire will be less active, the air will enter more readily, and the flame will be composed, in great part, of carbonic acid and air.

In any case the changes of slag that can thus be got by means of flame are slow. As a general rule for good work, it is necessary to refine, as much as possible, by means of oxidized compounds introduced with the charge, the flame merely serving to give the necessary heat, and made as reducing as possible. In this way the metal is preserved from oxidation, and great waste is avoided.

2. By the mixture of cast iron. Though the cast metals nearly always give too much ferric oxide, it may be necessary to produce it, in the case of a very slow cast metal. With this view there is added to the charge a portion of pure and little carburized cast iron. The total quantity of carbon existing in the furnace is thus diminished, and also, consequently, the agent which acts as reducer on the ferric oxide. If, on the other hand, it is required to reduce a too large quantity of this oxide, in order to retard the refining and obtain a product better fined and more homogeneous, there should be added to the charge a portion of cast metal highly carburized, but retaining its carbon little.

3. By the manner of work. We may obtain with a single cast iron the same effects as those got from a mixture, by adopting a particular mode of work. If one perceives that he has got too much ferric oxide, he may reduce it by stirring only for a moment, so as to produce a little iron which will act as a reducer, before commencing the regular stirring. He may also advance the fusion of one part of the cast metal to produce the same effect, as one may retard the fusion of another part, to carburize the iron.

4. By introduction of foreign matters into the furnace, such as pieces of calcareous minerals, broken iron, scrap iron. The introduction of such matter is useful only in the case of a thin slag. Ore introduced during the stirring, thickens the liquid by means of the lime it contains; the mixture of the molten metal and of the slag becoming then more intimate, the iron comes more quickly to nature. It must not be forgotten that the abuse of ores may render the slag too thick; a case which gives the same trouble as a dry slag. The broken iron should be introduced before the charging of the cast iron; it is oxidized while this melts, and with a twofold effect. First, it provides a more resistant hearth—a very necessary thing in working with cast metals that give thin slags; and next, it renders these latter more basic. When the broken iron is introduced during the stirring, it acts quite simply by the cooling which it brings into the liquid mass. It brings to nature the iron not completely refined.

5. By introduction of irreducible oxides into the furnace, such as peroxide of manganese, and soda in the state of carbonate. These matters are only employed in the manufacture of puddled steel. They then serve to give the slag that fluidity which it lacks in the latter periods of the work.

6. By the action of charcoal. Charcoals may act on the composition of slags by the flame they give. Charcoals which distil a great deal of gas give generally the best products. Beside the economy of fuel they ensure, as we shall see further on, they hinder oxidation of the metal, reduce the ferric oxide, and carburize the iron. Poor charcoals, giving little flame and burning on the spot, occasion great waste, because they do not feed the iron, and are the cause of much greater consumption of fuel.

EXAMINATION OF THE PRINCIPAL DIMENSIONS TO BE GIVEN TO PUDDLING FURNACES.

Fire grates.—The surface of the grate should depend, here, as in all fireplaces, on the quantity, and also, in part, on the quality, of the fuel to be burnt in a given time. The examination of several furnaces has taught us that those which cause the least consumption of fuel have nearly one-third square centimetre opening of grate per one kilogramme of coal burnt per hour. Everything leads us to believe this is the best proportion that can be adopted. Indeed, we cannot suppose that charcoal is burnt differently on the grate of a puddling furnace and in an ordinary fireplace; now in the latter the most economical combustion is obtained when the opening of the grate is constructed on the base mentioned.

To estimate the disadvantages which arise from too small grates, consider two furnaces quite alike, having chimneys of the same section and hight, but with grates of very different surface; and suppose that it is required to obtain, in the two apparatuses, the same quantity of heat, or, in other terms, the same degree of temperature. It is evident the two chimneys, exactly alike, will produce sensibly the same passage of air, since the draught varies very little with the temperature, within wide limits; but these volumes will traverse the grates with very different velocities, and in inverse ratio of the openings they present. It is easily understood that the greater the velocity at entrance the more will there be of air which escapes combustion; and consequently, the greater will the loss of heat be, and the more will the arrangement come short of the degree of temperature that is desired. Now the analyses of M. Debrette, inserted in M. Combes' report on the means of burning or of preventing smoke (*Annales des Mines*, 4th sec., t. XI., p. 149), show that if half of the air drawn by the chimney has not served for combustion, the loss of heat, due partly to the air in excess, and partly to the imperfection of combustion, is about 22 per cent. of the total heat obtained; that it keeps nearly the same, when the volume of air which traverses the grate without being burnt is comprised between three tenths and six-tenths of the total volume; but that it rises, and may even reach 39 per cent. when the volume of unburnt air reaches three quarters of the total volume drawn by the chimney.

The figures now given speak sufficiently in favor of grates well proportioned to the quantity of charcoal to be consumed; and we believe that it is to the small heating surface that the large consumption of fuel, and the great waste, in certain puddlings, is partly to be attributed. Indeed, the gaseous current being more oxidizing, the iron is more burnt, and the air drawn in in excess not only carries away a great quantity of heat, and renders the combustion less complete; but, owing to the high velocity at which it must pass through the layer of fuel, it also carries with it, mechanically, a considerable quantity of charcoal dust.

It may, perhaps, be objected that in the large grates the parts distant from the sole have not much useful effect, and that the flame does not reach into the laboratory. We believe we may reply that, above all, it is necessary to produce the maximum of heat which a quantity of fuel can give in a given time, and to produce it in the most economical way possible; and that the parts of a large grate near the cuvette will always give as much flame as another much smaller furnace.

To sum up what we have said with regard to the surface of grates in puddling furnaces, we attribute to these, when they are proportioned to the quantity of fuel burnt, the following advantages: 1. Economy of fuel, due to a combustion more gradual and complete. 2. Greater production of vapor by the generators, due to a hotter gaseous current, because of the absence of an excess of unburnt air. 3. Less waste, from absence of a too large quantity of oxigen in the gaseous current. We may also remark that, the furnace being hotter, the puddler may lower the damper somewhat, during a part of the work, and thus withdraw the metal from the oxidating action of the air.

In the different furnaces, which we have had occasion to examine, the surface of the grate is pretty generally comprised between 0·50^{m2}, and 0·75^{m2}, for working a weight of white cast metal which varies from 220 to 230 kil. In certain English works, however, we have found grates with as much as 1·30^{m2} of surface, for treating 200 kil. of cast iron per operation Compared with the furnaces of the Haute-Marne, the department of the Nord, and the Saarbruck Valley, it is those of the two valleys of Belgium that have the largest surfaces of furnace. While, in the first mentioned centers, charcoals with long flame are burnt, producing much heat in the sole, the coals for our rolling mills are generally of short flame, give a great deal of heat in the fireplace itself, but only heat the laboratory moderately; so that it becomes necessary to give the grate much larger dimensions to obtain the same quantity of heat in the hearth.

We may remark here that in the furnaces of the Haute-Marne, renowned for their small consumption of charcoal, the surface of the grate is proportioned to the quantity of charcoal burnt. The same dimensions of grate are generally preserved for working of cast iron of superior quality, but smaller quantities are operated with, and smaller hearths. With the same surface, grates should always have the greatest width possible, so as to bring the liquid metal near the place of production of heat.

To conclude what relates to grates, we will recall what is said on the question in works that are most generally consulted on metallurgy of iron.

In the treatise on manufacture of iron, by Flachat, Barrault and Petiet, we find, in the chapter on puddling, p. 280, "The fire grate is arranged so as to be able to burn 70 to 90 kil. of coal per hour, and, with this view, the grate is made with a surface of 0·70^{m2} to 0·90^{m2}." According to these data, the surface of the grate is well calculated. Supposing that the relation of the total surface to some of the openings varies from four to three, the grate should have a quarter to one third square decimetre of opening, to burn one kil. of coal per hour.

A glance at the detailed drawings of puddling furnaces, given in Dr. Percy's "Complete Treatise of Metallurgy," shows that in England the size of the grate is generally in proportion to the quantity of charcoal to be burnt. This is the case in the works at Bromford, near Birmingham, South Staffordshire, where the furnace grates, considered by the author as of a good type, have a surface of 1·30^{m2}, allowing 0·37^{m2} opening between the bars. The consumption of charcoal per hour being about 140 kil., we find here again nearly the relation which we have indicated—one square decimetre of surface, or one third square decimetre opening per one kil. of coal per hour. In the works at Ebbw Vale, in South Wales, we find grates having 1·08^{m2} surface, with 0·35^{m2} opening. The puddling furnaces of Blaina have grates of 0·71^{m2} surface, 0·32^{m2} opening.

There are very great variations in the surface of escape at the fire bridge; it varies from simple to double, and more. In the furnaces of the Haute-Marne we find 0·36^{m2}; in the English furnaces, and notably in the works at Ebbw Vale, 0·45^{m2}; in the Belgian furnaces, 0·23^{m2} and 0·25^{m2}; and in a forge of the department of the Nord the section has even been diminished to 0·17^{m2}. We much prefer a large opening to one too small. In the latter case the draught is counteracted, the gases of combustion have to pass with a very high velocity, and, moreover, one must see that the flame reaches the sole easily, especially with charcoals that burn on the spot. The dimensions to be given to the escape by the fire bridge are often limited by the width of the grate. One can understand how it would be unwise to seek to regain in hight what was lost in breadth; but we believe that 0·35^{m} may safely be allowed from the upper face of the fire bridge to the dome, if the latter have an inclination sufficient to send the flame down to the liquid metal.

The depth of the grate below the fire bridge varies between pretty wide limits, from 0·33^{m} to 0·50^{m}. We do not see any reason which justifies giving the flame such a long course to run before reaching the labaratory. We believe, on the contrary, that it is very useful to diminish this distance, in order that the combustion may take place as near as possible to the space where the heat is utilized, provided the furnace can contain sufficient charcoal, and that, in feeding the fire, the fuel does not fall into the cuvette. The smallest dimension indicated (that given in the furnaces of the Haute-Marne) is more than sufficient.

Kunzel's Combined Phosphor Bronze and Soft Metal Bearings.

Dr. Kunzel, who is well known on the continent as a scientific and practical metallurgist, has found that when phosphor bronze is combined with a certain fixed proportion of lead the phosphorized triple alloy, when cast into a bar or bearing, segregates in o two distinct alloys, one of which is a hard and tough phosphor bronze containing extremely little lead, and the other a much softer alloy, consisting chiefly of lead, with a small proportion of tin and traces of copper. The latter alloy is nearly white, and on fracturing the cast mass, it is found to be nearly equally diffused through it, the phosphor bronze alloy forming, as it were, a sort of metallic sponge, all whose cavities are occupied by the soft metal alloy segregated from it. The segregation into two or more alloys of the compounds of copper with tin and zinc has long been well known, and constituted always the *bete noir* of the bronze gun founder; but in all these cases the conditions of the segregation were such that the greater part of one or other of the alloys segregated itself, in a more or less massive form, either in the center or toward the lower part of the casting. The phenomenon was to the founder simply a nuisance, and no attempt was ever made that we are aware of to turn it to any useful account by so constituting the alloy and so manipulating its treatment in casting and cooling that the segregation should be found nearly uniformly diffused throughout the casting.

Of these facts Dr. Kunzel has taken advantage for the production of railway and other bearings. In heavy bearings, such as those of marine engines, &c., the valuable properties of Babbitt metal and other like alloys, when employed as bearings in preventing the cutting of the shafts, are well known; but these soft metal alloys, when used alone, are liable to the formidable objection that under severe pressure—or even a very moderate pressure, accompanied by vibratory concussion, as in the case of railway axles—such soft metals rapidly become distorted in form, and cease to support the journals in their proper places. The marine engine maker, therefore, has resorted to the device of casting in hard gun metal a hollow cage of the proper form for the intended bearing, the cavities of which he then fills up by casting into them the soft metal alloy, which is to form the actual rubbing surface of the bearing. The cage of hard metal gives its support on every side but one to the soft metal within it, which cannot be distorted, or squeezed out, nor escape in any way but by surface abrasion. This is, in fact, what Dr. Kunzel effects in a different manner by the peculiar constitution of the alloy which he adopts for his bearings, and which forms its own cage for the support of the soft bearing metal which has separated from it in cooling. The advantages claimed, then, for bearings thus formed of this peculiar alloy are that they combine the extremely small friction and non-abrasion of the journals—which are the known properties of all soft metal bearing alloys—with the firm resistance to pressure and durability in form of bearings of hard alloys, such as gun metal, which are not only abraded themselves, but more or less abrade the journal likewise. We are not in a position as yet to pronounce upon experimental data how far these views—which certainly look very promising—may prove realized in practice. So little is really yet known of what goes on between two metals differing in physical properties when mutually rubbed together at various velocities and under varying pressures, rising to that at which the two metals begin to bite or adhere, that we do not think anything short of scientifically conducted and prolonged experimental trials can determine the actual value of Dr. Kunzel's new bearing alloys, however much we may anticipate results both new and favorable from such experiments.

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All Nicholson Files are cut with the Patent *Increment Cut*, an invention owned and controled exclusively by us, the file cut in this manner being Patented as a new article of manufacture, and differs from all other machine cut files (all of which have their teeth cut with equal spaces) by being cut with teeth slightly *expanding or increasing in size and space from the point*, thus avoiding the too great regularity of teeth common to all other machine cut files. The tendency of all cutting tools with teeth or cutters placed at regular distances from each other may be illustrated (to the machinist at least) by the fluted reamer—as it is well known that if a round reamer be made with (say 12) teeth whose spaces are equidistant, the hole reamed will *not* be round and smooth, but will approximate to a hexagon in shape. Whereas, if the same number of teeth be made of irregular distances, the hole reamed will be both round and smooth. The same is true of a file, hence the necessity of its having teeth at unequal distances, and to which we have applied the name of Increment Cut File, which possesses all the advantages of hand cut work, and the accuracy and uniformityof machine work. It is now upwards of seven years since this File was introduced to the public, and the demand has increased until our production is undoubtedly treble that of any File manufactory in the country.

We put all files under seven inches in boxes of either one-half or one dozen each. These boxes are neatly arranged, and open on the end, on which the kind is plainly marked with printed labels, acknowledged improvements on the old methods.

The "*Increment File*" is not an experiment, but an established fact, and already has acquired a legitimate demand for upwards of 500 dozen per day. We employ no *regular Travelers*, but our goods may now be found in the hands of the principal jobbers and dealers throughout the country.

Prices and terms will be forwarded on application to

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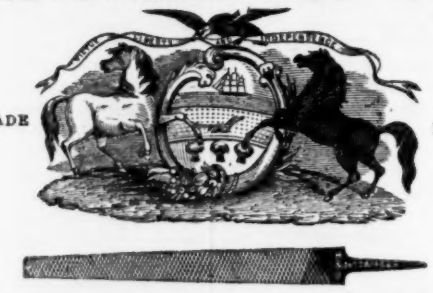

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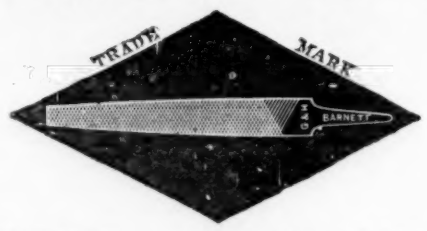

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IMPORTED STEEL,

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Hammers, Crow bars.
Sad Irons.
Boring Machines.
Cast Iron Hatchets.
Coffee Mills.
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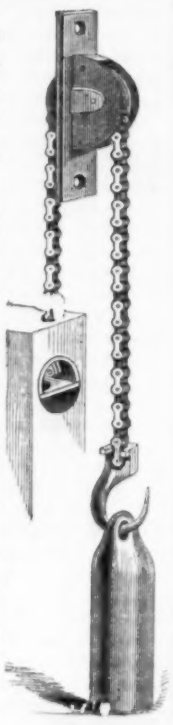
Manufacturer of

Brass & Copper Chain,

And patented attachments for same, for suspending windows, from 100 to 1500 lbs. Sashes can be suspended with my Chain and attachments in a shorter time and with less trouble than by using the ordinary common cord. I am now offering the Chain and fastenings cheaper than any other in the market. Also manufacturer of the MORTON & BREMNER'S Straight and Circular Spring Balances. Established in 1842.



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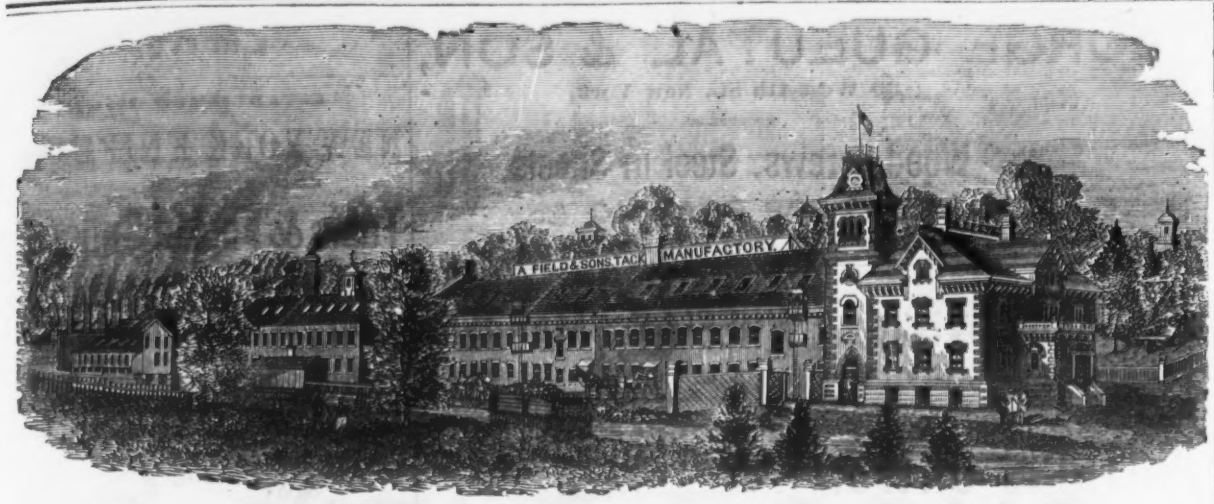

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Fine Two Penny and Three Penny Nails, Channel, Cigar Box and Chair Nails, Leathered Carpet Tacks, Glaziers' Points, etc., etc.

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Having doubled their Manufacturing facilities, they can now fill orders promptly.

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Where Catalogues and Discounts can be had on application.

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To AMERICAN MANUFACTURERS we offer our services for the introduction, in Great Britain and the Continent, of MACHINERY and TOOLS of improved construction. It is now seven years since we established ourselves in London, and during that time we have succeeded in establishing a demand which is now rapidly increasing, thus proving the value of these goods throughout Great Britain and the Continent. We are now the European Agents for several leading American Tool Makers, to whom we will give reference on application to either our London or New York house.

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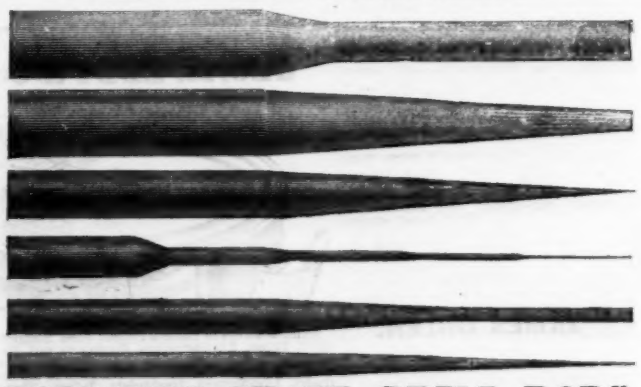
Manufacturers of *HOPSON & BROOKS' Patent Made*



POLISHED STEEL DRILL RODS,

Straight Polished Steel, Iron, & Brass Wire Cut to any Length & Exact Size.

Tapered Articles from either Round or Square Wire any shape or size. Also, **Capewell's Giant Nail Puller.**

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LOWMAN'S PATENT CAST STEEL

SHOVELS, SPADES & SCOOPS

Of all Descriptions,

Without straps or rivets, of the best English and American Cast Steel. Every Shovel warranted. Printed lists of prices and discounts to be had on application at the office.

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EAGLE IRON FOUNDRY. DEMAREST, JOYCE & CO., Iron Founders, MACHINISTS, and Manufacturers of Sewing Machines, Steam Fittings, AND LIGHT WORK of all kinds. ALSO **Plain and Ornamental Japanning.** **20 to 30 Morton, and 57 to 65 Clymer Streets, BROOKLYN, E. D., N. Y.** EAGLE IRON FOUNDRY.

BUSINESS ITEMS.

NEW JERSEY.

The Central Railroad of New Jersey will erect a wrought iron pivot bridge, 472 feet long, and six fixed spans of 150 feet each, over the Raritan River, at South Amboy. The pivot span will be the largest in the world. The plans proposed by the Keystone Bridge Company have been adopted, and the work will be executed by that company.

Ground has been broken for an iron furnace at Hackettstown, between the railroad and canal, twenty acres having been set apart for it. The furnace is to be a 15 feet bosh, stack 55 feet, and will have a 400 horse-power engine. It will be capable of turning out from 200 to 225 tons of iron per week.

The Cummings Car Works, at West Bergen, are building a number of passenger cars for the Rensselaer and Saratoga Railroad.

The Danforth Locomotive Works, at Paterson, is still at work on a heavy order for the Baltimore and Ohio Railroad.

The furnace at Oxford, erected in 1742, has been remodeled and supplied with new hot blast, &c., whereby its capacity for producing has been increased from 80 to 115 tons of pig iron per week. A new bolt factory has been erected, the rolling mill has been enlarged, and a number of nail machines have been added. A series of improvements are being made at the mines situated near the town.

PENNSYLVANIA.

The Reading Company is rapidly completing its new ship yard and plate mills at Port Richmond, the buildings for which will be 240 by 100 feet, and one of which will have a molding loft of 60 by 260 feet. The initial expenditure for the enterprise is $600,000, and adjoining the yard will be constructed a dry dock 60 feet wide and 525 feet long, capable of holding any ship afloat, except the Great Eastern.

At New Castle, six blast fusnaces are in blast and one out. The Shenango rolling mill, plate mill, and nail factories are in operation, the mill running single turn. The Onondaga rolling mill is running double turn, and the nail factory in connection with the mill is running to full capacity, and the plate and sheet mill is also kept in motion.

A muck bar iron mill is being built in Lebanon.

The Pottstown Iron Company have recommenced manufacturing operations.

At the Delaware River Iron Shipbuilding and Engine Works, Chester, the masts of the City of Peking are now being finished. These, three in number, are of iron, 138 feet in length, with a diameter from 8 to 36 inches. They are formed of heavy rolled plate iron, and their construction is a work of difficulty, patience and labor. About fifty men are now engaged actively in their completion, some of whom are obliged to work inside. When we state that there is barely room for a man inside, and his progress through the iron tunnel is analogous to ascending a tight chimney, with all the advantages in favor of the sweep, inasmuch as the latter can keep his head perpendicular, while the workers must lie horizontally, and that, although sheds are erected over the masts, water poured on to keep them cool, and air introduced by pipes, the men cannot remain in their iron prison house more than fifteen minutes, all can realize the statement made recently by one present, that "this is worse than working in the caissons of the bridge over the East River at New York city."

OHIO.

On the 2d instant the Coshocton Iron and Steel Works were sold at assignee's sale. They brought $57,000, which is about half the appraisement value. One-third of the purchase money was paid in hand on the day of sale; one-third is to be paid in one year, and the remaining third two years from the day of sale, the deferred payments to bear interest at 7 per cent. per annum from day of sale, and to be secured by mortgage on the premises. The works were bought by a number of the citizens of the town.

Capitalists from Cleveland have purchased a tract containing about twenty acres, near Portland, with the expectation of erecting a rolling mill there at an early day.

Wick, Ridgeway & Co., of the Valley Iron Mill, of Youngstown, are making extensive improvements in their mill, and when completed expect to turn out 1000 tons of rails per week. Among the improvements is machinery for handling and loading the iron rails.

The Stilwell & Bierce Manufacturing Company, of Dayton, have recently received a letter from Satsporo, Japan, highly praising the action of one of their 48-inch eclipse double turbine water wheels.

J. L. Gill, proprietor of the Columbus Car and Car Wheel Works, is now manufacturing eleven cars a day for the Baltimore and Ohio Railroad Company. There are three hundred men employed in the establishment, who, by means of new and improved wood working machinery, accomplish the same amount of work formerly done by three hundred and fifty hands.

Messrs. McIlvain & Spiegel, boiler makers, of Cincinnati, have been awarded the contract for twelve new boilers at the city water works.

MASSACHUSETTS.

The Lawrence Boiler Works have a contract to build two bleaching tiers and a steam box for the Pacific Mills. They are having a 15-horse engine put in, and setting a new boiler. The works will be running by July first, with 15 hands, double their present force.

The Gosnold Mills, of New Bedford, will soon begin the manufacture of iron chains. All the chain manufacturers in this part of the country buy their iron ready rolled. By putting on an additional process in the same mill, it is expected that the manufacture can be made profitable, as it saves once freighting.

Frederick A. Brown & Co., of Pittsfield, are building a brick foundry on Clapp street, which will give employment to 30 or 40

The main building will be 100x45 feet, with an addition 14x18 feet. It will be ready for occupancy in six or eight weeks. This will be a valuable addition to the manufacturing industries of the town.

The Ames Plow Company has leased for ten years the new buildings erected in Worcester by Hon. Stephen Salisbury, and will occupy them as soon as they are completed. It is probable that the company will continue operations at Ayer Junction, and do all their manufacturing in Worcester when the new quarters are ready.

CONNETICUT.

Twenty-five different varieties of sewing machine shuttles are manufactured by the Billings & Spencer Co., Hartford, embracing shuttles for every known make of sewing machine. The finest and most perfect machinery is required in their manufacture.

Three car loads of castings and machinery were recently sent from the Birmingham Iron Works for shipment by the Housatonic Road to Omaha. The material is to be used in the construction of bridges on the Union Pacific Railroad.

The New Haven Car Company recently turned out some passenger coaches for the New Jersey Midland.

MISSOURI.

The St. Louis Vise and Tool Works, at St. Louis, for the manufacture of blacksmiths' and machinists' tools, and Mann's Patent Metallic Sieve Works, are new enterprises just started and doing well.

St. Louis Rail Fastening Co., built in 1870; 3 heating furnaces, 2 trains of rolls and 3 spike machines; steam power; product, spikes and bolts; annual capacity, 6000 net tons; average yearly production, 35,000.

St. Louis Bolt and Iron Co., in East St. Louis. Put in operation in January, 1873; 2 single and 2 double puddling furnaces, 3 heating furnaces and 2 trains of rolls; steam power; product, bar iron, small T and street rails, fish plates, bolts and washers; annual capacity, 6000 net tons.

INDIANA.

A new iron furnace is to be built at Worthington, by a new company called the "Green County Iron Works Company," having a capital of $600,000. The company will manufacture pig iron.

The furnace at Knightsville has just blown out, and not a furnace or rolling mill is now in operation in that (Clay) county. Nearly all the coal mines have also suspended.

WISCONSIN.

The contracts for the building and machinery of a new rolling mill, at Milwaukee, for the Milwaukee Iron Company, are already let, and it is expected to have the new establishment in full operation by the 1st of September next. The main building will be of brick and iron, 80 by 216 feet, and the capacity of the mill is estimated at 50 tons of bar iron per day.

MARYLAND.

The Baltimore Bridge Company, a few days since, received a contract to build two iron bridges for the Lima and Huach Railroad, of Peru. Each bridge will consist of two spans, each span sixty feet in length. In all the Baltimore Bridge Company have constructed thirty-one bridges for different corporations in South America, one of them being more than 500 feet in length and at one point 252 feet in hight.

The Abbot Iron Company, at Baltimore, is one of the most extensive establishments of the kind in the country, the works occupying nearly eleven acres of ground. About 700 men are employed this season, the usual number being 1000. The product of railroad iron for 1874 will amount to about 20,000 tons, the full capacity of the mills being 45,000 tons per annum of rails, and 10,000 tons of plate iron, finished and rough.

The Doom of England.—Now, says the *Contemporary Review*, let us face boldly and state in the plainest language what the industrial decadence of our country, whether it will come sooner or later, will mean when it begins. (Statistics are unnecessary here; they cannot be precise, and might give rise to useless controversy on details.) It will mean that we shall lose one foreign market after another; that we shall gradually cease to manufacture for other manufacturing countries; then that those countries, after supplying themselves, will meet us and beat us in neutral markets; finally, that we shall be reduced to the supply of our own demand—possibly to secure even that market by recurrence to a protectionist policy. This will be a terrible reverse—a momentous, and, it may be, a miserable change. It must invoke a vast and grave metamorphosis; it may, but it need not involve ruin. The extent and depth of suffering we shall have to undergo during the sad progress and the weary struggle will depend upon how soon and how distinctly we recognize the coming revolution, and how wisely and courageously we meet it. The great, ultimate, naked fact we have to look at is this: The home demand for our iron, cotton, woollen goods, &c., may be about one-third of the whole; we manufacture mainly for foreign consumption. About one-third of all our productive industry is all that we can hope ultimately to keep going. Two-thirds of our artisan population, therefore, must cease to be—or to remain. That vast proportion of our imports which is now paid for by our millions of exports will have to be foregone, or to be purchased by other funds. To speak broadly; the population of these islands, which is now maintained by agriculture, commerce and manufactures, will have to be maintained by agriculture almost alone. We shall, therefore, only be able to support 20,000,000 people, instead of 30,000,000, as at present. England will become a second Holland, greater, richer, more powerful than the first. But she may be a prosperous and happy Holland still, if she only sees her destiny in time, and girds up her loins to meet it as a great nation should.

H. W. PEACE,

MANUFACTURER OF

SAWS OF ALL KINDS.

FACTORY, WILLIAMSBURGH, N. Y.

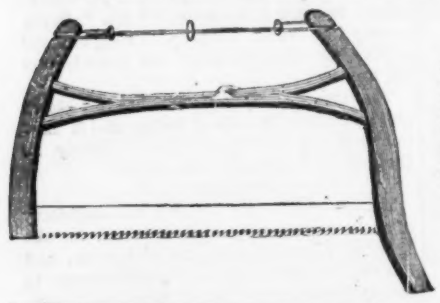
AMERICAN SAW CO.,

TRENTON, NEW JERSEY.

Solid saws require frequent gumming, thereby subjecting them to risk of springing or breaking. This is especially the case with cross cuts having *Patent Teeth*. In the perforated saws **all gumming is avoided** and the teeth are easily kept long and in *proper shape*, saving *files*, *labor*, *expense* and *vexation* As is well known, our saws cut faster, smoother and easier than any other.

MOVABLE-TOOTHED CIRCULAR SAWS AND SOLID SAWS OF ALL KINDS.

Hankins' Elliptic Forked Saw Frame.



Patented June 28th, 1870.

The annexed engraving represents HANKINS' ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any center bolt, secures for the Frame great strength and durability. These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

HARVEY W. PEACE,

VULCAN SAW WORKS,

WILLIAMSBURGH, N. Y.

THE SILVER STEEL

DIAMOND CROSS-CUT SAW.

$1.50 Per Foot.

PATENT HANDLES AND GAUGE INCLUDED.

Patent Secured

THIS new Saw, which is destined to take the place of all Cross-cut Saws in point of **SPEED AND EASE**, is manufactured by E. C. ATKINS & CO., Indianapolis, Ind., who are the

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So confident are we that this is the best Cross-cut Saw in the market that we CHALLENGE THE WORLD. Orders promptly filled.

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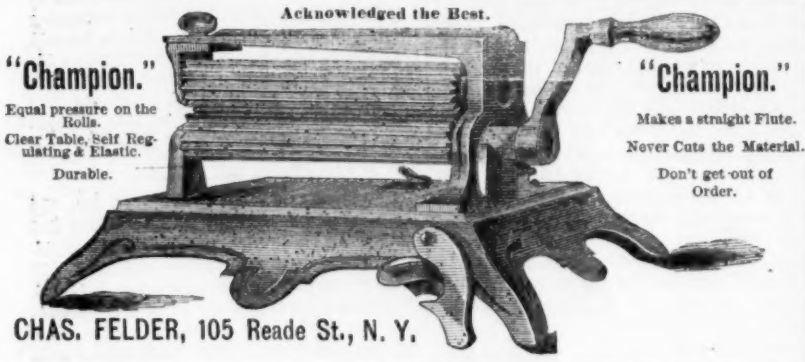
"Champion."

Equal pressure on the Rolls.

Clear Table, Self Regulating & Elastic.

Durable.



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Makes a straight Flute.

Never Cuts the Material.

Don't get out of Order.

CHAS. FELDER, 105 Reade St., N. Y.

J. FLINT & CO.

Manufacturers of all kinds of SAWS and PLASTERING TROWELS.

ROCHESTER, N. Y.

Dietrich's Patent Wood Saw. Guaranteed the strongest, lightest, easiest to strain or tighten and best braced wood saw made; also to give perfect satisfaction.

Dietrich's Patent Double Handle Rip Saw. All will readily see the benefit of this useful invention.

J. Flint's Patent Plastering Trowels. The best made and finished Trowels in the world. We make four grades of Plastering Trowels, from the best to the cheapest.

Our patent method of grinding hand saws makes them superior to any in the market.

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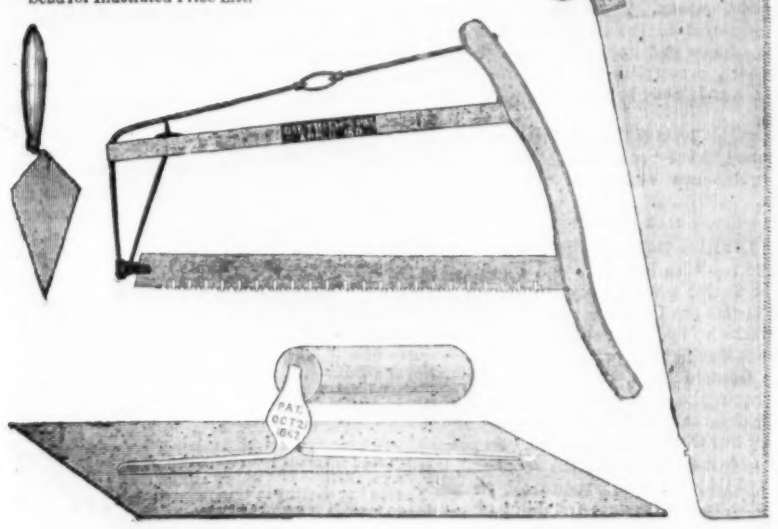

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Bed Screws, Pin Hinges, and Wire Nails a Specialty.

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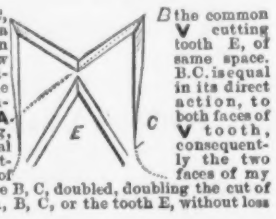
LIGHTNING SAWS.

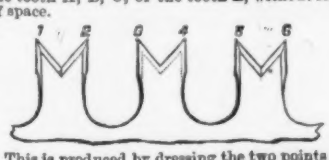
A Challenge of $500, toward expense of a public test, to prove that the Lightning Saws excel all others in Speed, Ease, and Simplicity, has been offered since 1870, and has never been accepted. More than 100,000 Lightning Saws were sold during the year 1872, the purchasers of which testify to their superior merits.

Our leading papers, such as the *Tribune, American Agriculturist, Christian Union*, etc., have published over sixty editorial notices recommending these Saws. Farmer's Clubs, Lumbermen, and Hardware Dealers unite in propounding the genuine Lightning Saw the greatest labor-saving implement of the age.

I have hundreds of letters from practical sawyers, voluntarily written, expressing their entire approval of these Saws.



A, B, C, represents a common drag saw tooth for cutting in one direction only, for [A wood sawing, and is equal to both cutting edges of M tooth are B, C, doubled, doubling the cut of the tooth A, B, C, or the tooth E, without loss of space. B the common V cutting tooth E, of same space. B. C. is equal in its direct action, to both faces of V tooth, consequently the two faces of my



This is produced by dressing the two points of my M tooth, to cut in line so that the outside B, C, has four times the space of the slant edge behind it, or from 1 to 5, while slant has space from 1 to 2, the inefficient slant edges are thus practically concealed and do but slight surface cutting, while B, C, edges cut and clear simultaneously.

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E. M. BOYNTON, 80 Beekman Street, New York,
Sole Proprietor and Manufacturer.

N. Y. Saw Frame Co.

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SOLE AGENT.

I make a specialty of the LARGEST SIZES of **Circular Saws**, and call particular attention of lumber manufacturers to the following points of excellence:

Evenness of Temper.—The peculiar structure of my furnace subjects all parts of the saw to a DEAD heat, and when dipped in the oil bath secures perfect uniformity.

Perfect Accuracy in Thickness.—My saws are ground on a patent machine, automatic in its operation, grinding off the thick places upon the plate before the thinner parts are reached, and when the saw is removed BALANCES PERFECTLY, which is proof positive of the right accomplishment of the work.

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I am sole proprietor and manufacturer of the celebrated **"Challenge" Cross-Cut Saw.** Price Lists of all kinds of saws sent on application.

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and assures the trade that his stock, assortment and prices are not equaled by any other parties, whatever their pretentions. NEW YORK, April 1st, 1873.

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Having compiled a complete list of the **Hardware Dealers** in the United States, expressly for addressing circulars, I am prepared to receive orders for addressing **ENVELOPES, CIRCULARS, &c.** The printed address is cut from the list and stamped upon the envelope or wrapper, thus enabling me to address a great number in a short space of time, and at rates far below the prices usually paid for this work. It answers all purposes, and can be done for one-third the expense of addressing by hand. My list contains names of over 4000 dealers, each State, city and town therein, being compiled separately. Wholesale Dealers and Manufacturing Co.'s, whose custom it is to send out circulars, price lists, &c., to the trade throughout the States, cannot fail to find my list and style of addressing a great advantage to them, as it is a great saving of both time and expense. It has been tried by a large number in the trade, some of whose names appear at the bottom or this circular, and to any of whom I would most respectfully refer. My rate for addressing is $2.50 per M. Envelopes, &c., sent to the address below will receive prompt attention, and will be addressed and returned at once, or envelopes, &c., will be furnished at market prices. For further information, address,

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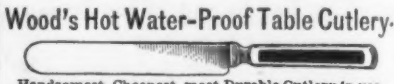

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[From the *New York Times*, June 22.]

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The **only Knives made** that are put together in such a manner that there is no strain on the covering or frail part of the knife. We warrant our knives equal in cutting qualities and workmanship to any made, and are acknowledged by English makers as the **Best American Knife.** We also make

NICKEL & SILVER PLATED POCKET KNIVES

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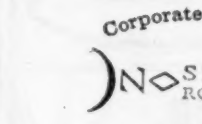

Granted 1777

RICHARD A. TURNOR,

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AMERICAN

PEN AND POCKET KNIVES,

MANUFACTURED BY PEPPERELL,

Aaron Burkinshaw, AB MASSACHUSETTS.

My Blades are forged from the best Cast Steel, and warranted. To me was awarded the GOLD MEDAL of the Connecticut State Agricultural Society; also a Medal and Diploma from the Mass. Mechanics' Ass'n Sept., 1869

The Stevens Iron-Clad Steam Battery.

By a provision in the will of the late Edwin A. Stevens, of Hoboken, New Jersey, his executors were directed to complete an iron steam-vessel, then lying unfinished in dry dock in the city of Hoboken, making of said vessel an effective iron-clad, and, when completed, to present the ship to the State of New Jersey.

It was further directed that the machinery and tools used in construction, and not exceeding one million of dollars in money, should be appropriated for the purpose of carrying out this provision of the will.

It was still further provided that, should the State of New Jersey not receive the said vessel, the executors were to sell the ship and to retain the proceeds of such sale as a part of the estate of the testator.

A special Act of Congress having been obtained, authorizing the State to accept the gift under the provisions of the will, the Legislature, by an Act approved April 1st, 1869, accepted the vessel on the terms above stated, and a commission, consisting of Messrs. Fitz John Porter, Benjamin G. Clark and William W. Shippen, was appointed to advise with the executors, and to represent the State during the completion of the vessel.

Under authority conferred as above, and in accordance with the previously expressed desire of the testator, Gen. George B. McClellan, U. S. A., was appointed as engineer to assist in determining upon the proper method of completing the vessel, and to take charge of the work. On the recommendation of Gen. McClellan, Mr. Isaac Newton was engaged as assistant engineer.

By the advice of the engineers, it was determined to make important modifications with the object of complying with the directions of the testator—to make the vessel "an effective iron clad for purposes of war."

It was concluded to introduce an inner skin, transverse water-tight bulkheads, water-tight coal bunkers, to build new engines, and to prepare the ship for transformation either into an iron-clad of the "Monitor" type, having very high speed, carrying a powerful armament within a turret of extraordinary thickness, and capable of acting efficiently as a "steam ram," or into a broadside iron-clad.

The bow of the vessel was modified accordingly, and was considerably strengthened by means of water-tight transverse and longitudinal bulkheads and breast-hooks.

A very strong inner hull, with seven transverse bulkheads placed at intervals of from thirty to eighty feet, was built, and a heavy wale strake was carried above the original upper line of the gunwale, making the vessel two feet deeper than before.

This was done by workmen employed by the engineer in charge, none of this work being done by contract. All of the iron was of the best quality, furnished by the Abbott Iron Co., of Baltimore, Md. The workmanship, as well as all material, was of the best possible description.

The new engines and machinery were built by the Delamater Iron Works, of New York, from drawings furnished by the engineer in charge, and were subject to rigid inspection as delivered. Material was charged by the pound and labor was paid for by the day. The reputation of the Delamater Iron Works is a sufficient guarantee of the excellence of this portion of the work.

The decks of the vessel were constructed of carefully selected well seasoned Georgia pine, well laid down, and so completely free from sap wood and from shakes, that no change of form or texture is perceivable. It was the intention of the executors, and of their engineers, to put afloat a vessel that should be the most formidable iron-clad on the ocean. The amount of money appropriated proved insufficient to complete the vessel, and, after the hull and the machinery had been nearly finished, the work was necessarily stopped, leaving the ship in the condition hereafter described. A question having been raised as to the real ownership of the vessel, suits in Chancery were commenced, and, pending these suits, the State Legislature, by an Act, to which reference has already been made, directed a positive sale and the payment of the proceeds into court. The vessel is therefore offered for sale as she now lies, with hull and machinery nearly completed, as exhibited in the following detailed description furnished by the consulting engineer to the commission.

If finished on the plan indicated by the consulting engineer, and already so far carried out, it is believed that the purchaser will acquire the fastest iron-clad in the world, and the most formidable steam ram afloat. The armament may be made to consist of the most powerful guns yet successfully constructed and worked, and the battery protected by armor of a thickness which has been attained with no vessel yet built.

The speed shown to be attainable is greater than that of any armored vessel known to have been tried, and is higher than even unarmored ships, such as the British "Magicienne," the "Rover" or the "Bacchante," which represent the fastest foreign men-of-war yet designed. Completed as a torpedo ship, the vessel would carry armor of sufficient thickness to secure safety against the projectiles of an enemy, while the speed attainable would insure, in a stern chase even, the capture or destruction of any vessel attacked. Dispensing, in this case, with a turret, a larger quantity of coal could be carried, and the ship would be capable of keeping the sea for a long time, and of making long voyages. Should it be determined to complete the vessel as a merchant steamer, the twin screw, with the two pairs of independent engines, the double bottom, and the almost indestructible bow, would afford an immunity from danger by breakage of machinery, by collision, or by running on shore, which would make the steamer a favorite one with prudent travelers.

The security against complete disability by injury of machinery which is given by the two screws and their duplicated machinery, would justify the total abandonment of all top hamper; and the vessel, built up two decks, would afford pleasanter and more comfortable quarters than are to be found on any steamer crossing the Atlantic. If considered advisable to introduce masts and sails, the great stability of the vessel would enable her to carry all the sail that can be put upon her.

The exceptionally high speed of the ship would be an important advantage, and all the above detailed advantages conspire to make the steamer available as an excellent fast passenger or mail steamer for any transatlantic line, and to make her particularly suitable for any line on which ships are at all exposed to danger of injury by ice, or of being cast away upon rocky coasts.

The following is an abstract of the Report of the Consulting Engineer to the Commission:

DESCRIPTION OF HULL AND MACHINERY.

Hull—General Dimensions.

Length over all	401 feet
" between perpendiculars	390 "
Breadth	45 "
" over armor	54 "
Depth to main deck	24½ "
Draught, maximum, fore and aft	22 "
Displacement at 22 feet draught	6006·02 tons
Area of immersed midship section	890·26 sq. feet
Ratio of immersed midship section to circumscribing parallelogram	0·867
Ratio of displacement to circumscribing parallelopiped	0·544

The general appearance of the vessel, if completed as here proposed, will be that of a "Monitor" iron clad.

The proportion of length to breadth—8·666 to 1—is that now usually observed in sea going high-powered steamers, and is somewhat less than in those which represent the extreme limit yet attained.

The lines are fair and fine, giving a sharp bow and the fine run; which is essential to the efficient working of screw propellers.

The proportions of the midship section, which has a breadth equal, very nearly, to double the intended draught, are such as are best calculated to make the vessel easy in a sea way.

The displacement per foot of draught at the intended load line is 424·19 tons, or 35·35 tons per inch. Removing the armor shelf, for the purpose of converting the ship to other use, the displacement at 22 feet draught would become 5658 tons, and the additional displacement per foot of draught would become 335 tons, or 27·9 tons per inch.

In this case, it would become necessary to build up the ship one deck, and it might be advisable to build up two decks.

If considered proper, an additional displacement could be secured, giving a total of 6329 tons at 24 feet draught, which draught can be carried over the bar at the entrance to the harbor of New York, and into every important seaport of Europe.

The balanced rudder is one of the important and valuable features introduced into the design of this vessel by its inventor, Mr. R. L. Stevens.

The hull of the ship is double, the inner and outer skins being separated by a space varying from 22½ inches at the bottom to 6½ inches at the top of the inner portion.

Seven transverse bulkheads are built, dividing the ship into distinct water tight compartments. Two additional bulkheads are carried across the ship below the berth deck. Coal bunker bulkheads, forward and aft, and the several smaller bulkheads in the extreme ends of the vessel, still further strengthen the structure, and assist in securing immunity from liability to founder in consequence of injury to the hull.

The hull is further strengthened by the bulkheads of the "turret chamber," which stiffen the whole structure by tying the decks, the coal bunkers, and the lower longitudinal bulkheads firmly together.

The double bottom is not only made water tight as a whole, but is divided into spaces of 32 feet in length each, separated by water tight partitions, formed by caulking frames and cross floors. These spaces were to be fitted each with its own pipe leading to the bilge pumps, thus enabling them to be pumped out separately. The stem of the vessel rises vertically, and is of a section ten inches by three. The cellular construction of the vessel behind it, and the immense strength of this portion of the hull, will enable it to receive very heavy shocks without serious injury. The whole of this part may be torn away to a distance of thirty-five feet from the stem, by intentional or accidental collision, without endangering the safety of the vessel.

Three of the partitions in the bow being horizontal, formed by the extension of breast hooks back to the transverse bulkheads, a projectile may penetrate, or a seam may start, at any one point without doing other injury than to fill one of these small compartments with water.

The stern "overhang" is carried well out over the rudder, which it fully protects. It is prepared to receive armor plating like other portions of the vessel.

The outer skin is composed of selected boiler plate, which is stated to have been tested, as received under the inspection of an officer of the government, and received only when found to have a tensile strength of 60,000 pounds per square inch of cross section. Its tenacity is at least 20 per cent. greater than that of iron customarily used in the construction of iron vessels by foreign builders.

The thickness of keel strake is one inch; the garboard strakes are five-eighths of an inch thick; the intermediate strakes are of half-inch iron, and the wale strakes are three-quarters of an inch in thickness.

The keel strake is double riveted, as are also the garboard and two wale strakes. The riveting has all been done by hand with both care and skill.

The inner skin is also of selected charcoal iron, of "C. No. 1" quality, such as is generally used only for boiler plate. Its joints were all planed and fitted under the inspection and the direction of the engineer in charge, and the workmanship is unexceptionable.

Its thickness is one inch for a distance of 193 feet amidships, ⅞ inch for a distance of 30 feet at the ends, and ¾ inch at the intermediate portions. It is double riveted fore and aft, with treble riveted butt-straps for 240 feet amidships.

The inner skin is carried up to the fourteen feet line, and is made water tight throughout, as already stated, permitting the rupture of the outer skin without endangering the safety of the vessel. This, with the division of the whole into short water tight spaces by caulking the frames, is an insurance against even loss of trim by the penetration of the water throughout the space between the two hulls.

The four full bulkheads nearest the middle of the vessel are of plating ¾ inch thick. All joints are planed and fitted, and all lines of junction with the hull are carefully strengthened and made water tight. Water tight doors with packing are fitted to the passage leading fore and aft, at these bulkheads. The bulkheads are stiffened by angle iron frames.

The four bulkheads immediately beneath the intended location of the turret are strengthened by angle iron frames, spaced 20 inches apart, extending from top to bottom.

The coal bunker bulkheads are of ⅛ inch iron, are water tight, and are strengthened by angle iron frames, 4x4x⅜ inch, riveted back to back.

The main deck is supported by heavy yellow pine deck beams, of scantling 14x14 and 16x14 inches, spaced usually 36 inches between centers. They rest, at each end, upon a heavy and very strong iron shelf, which serves also to strengthen the ship as a stringer.

The beams are also secured to the skin of the vessel by strong iron knees. They are intended to be supported in the middle by a line of iron stanchions not yet in place.

This deck is planked with selected Southern yellow pine, free from sap, shakes or other defects, and thoroughly seasoned. Its thickness is 8½ inches throughout. It is not fastened down.

The berth deck extends from the foremost bulkhead to the boiler compartment, and from the stern to the engine room bulkhead. It is supported by angle iron beams measuring 4x3x¼ inches, and spaced 24 inches apart. The planking is laid with splined joints and is 3 inches in thickness, except under the anchor-hoister, where it is 4 inches thick. This deck is laid down and permanently secured in place.

The plans of store rooms, officers' quarters, and all joiner works, remain to be prepared, and may be given any shape that be desired by the purchaser, or such as may be determined by the form ultimately given the vessel.

MACHINERY.—MAIN ENGINES AND BOILERS.—GENERAL DIMENSIONS.

Number of Steam Cylinders	4
Diameter "	72 inches.
Stroke of Piston	45 "
Surface Condensers, refrigerating surface	12,650 square feet.
Number of Screw Propellers	2
Diameter " "	18 feet.
Pitch " "	27 "
Numbers of Boilers	10 "
Area of Heating Surface	28,000 square feet.
" Grate "	876 "

The main engines are arranged in pairs, each of the two pairs driving a screw independently. Each pair has its own surface condenser and its own set of pumps, including a centrifugal circulating pump, driven by a small independent engine, taking steam from the main steam pipe. The main engines are of the vertical return connecting rod type, formerly known as the Mandsley and Field engine.

This general design was decided upon as being at once compact, readily accessible, and convenient in operation, and as "stowing" well in a ship of which the form was too fine to admit of twin engines of other types.

The steam cylinders are four in number, 72 inches in diameter, and having a stroke of piston 3 feet 9 inches.

The main valve is a balanced three-ported slide, having a maximum throw of 16 inches. The balance plate is similar to that used in the Dictator and other naval steamers. The valve slides between two scraped surfaces, in contact with each, no unbalanced steam pressure coming upon it from any direction.

It has 1 inch lap on the steam side, and no exhaust lap. The main steam ports are 3 feet long and 7 inches wide. The exhaust ports are of the same length and 11⅛ inches wide. The valve is operated by a Stephenson link.

The weight of the valve is intended to be taken by vacuum cylinders, suspended from the deck above, should the device be found desirable.

The reversing gear consists of an hydraulic cylinder, the piston of which drives a rack, which in turn moves a toothed sector on a rockshaft or tumbling shaft. This shaft carries an arm connected by a rod with the link. This work is all finely finished.

Expansion is obtained by means of a gridiron valve, situated at one side of the main valve chest, and driven by its own eccentric. The valve ports, eleven in number, are 1½ inches wide and 15¼ inches long.

The piston rods are four in number for each piston, all connected to a forged cross-head. They are 5¼ inches in diameter.

The connecting rods are 7½ feet long, 7¼ inches in diameter in the neck, and 8½ inches diameter in the middle. These rods, which seem to be as lightly proportioned as any part of the engine, have ample strength to resist any pressure which can be thrown upon them in regular work.

At their upper ends they are fitted with straps, and are set up by means of the common taper key. At the lower end they have caps secured by bolts and nuts.

(To be continued.)

A Business Opportunity.—Among our "Special Notices" this week appears an advertisement to which we take pleasure in calling attention. The advertiser, H. C. R., is a gentleman well known for some years in the metal trades of this city, in which he has established a reputation for business ability and personal character. As he seeks an opportunity for the investment of capital, such respectable and well established concerns as wish to increase their capital and take in a partner, who would be a valuable addition to any firm, will find this opportunity of doing so a better one than is often presented.

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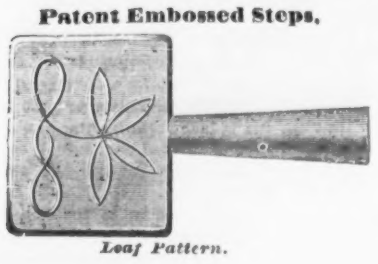
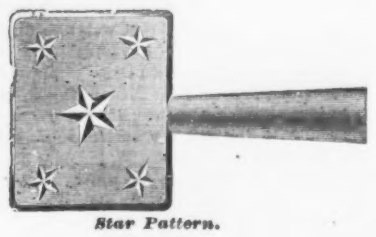
Patent Embossed Steps.



Leaf Pattern.

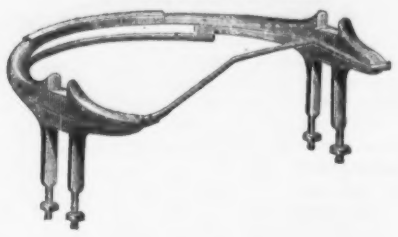


Star Pattern.

King Bolt Yokes.

Established 1850.

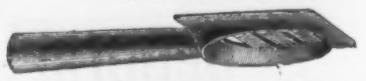
No. 6 Fifth Wheels.



1871 Pattern Shaft Couplings.

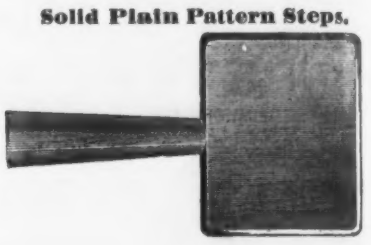
Patent Cross Bar Steps.

Upper View.



Lower View.

Solid Plain Pattern Steps.



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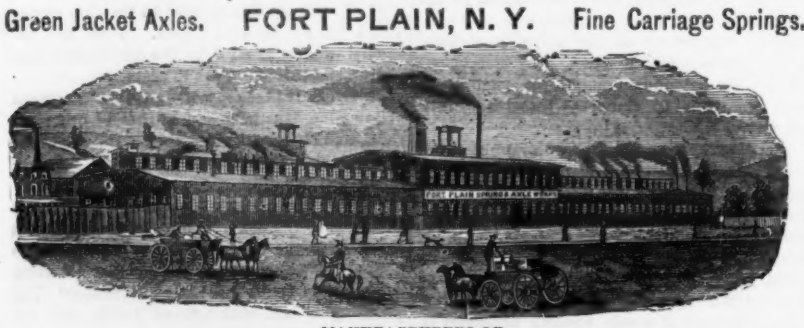

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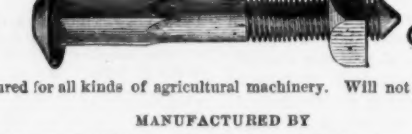

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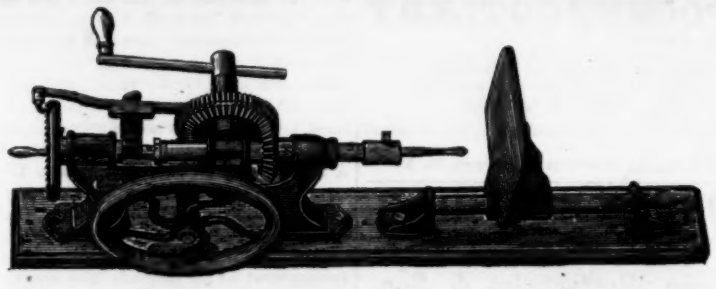

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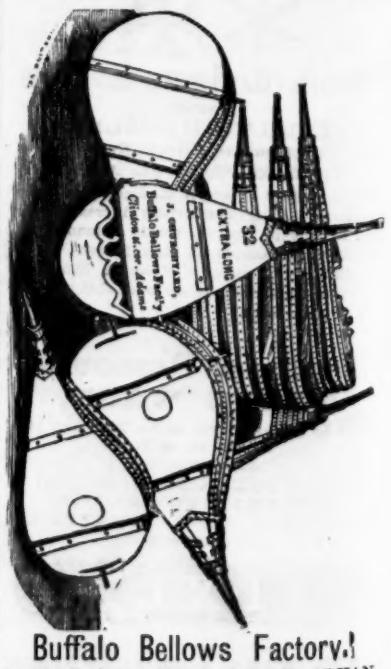

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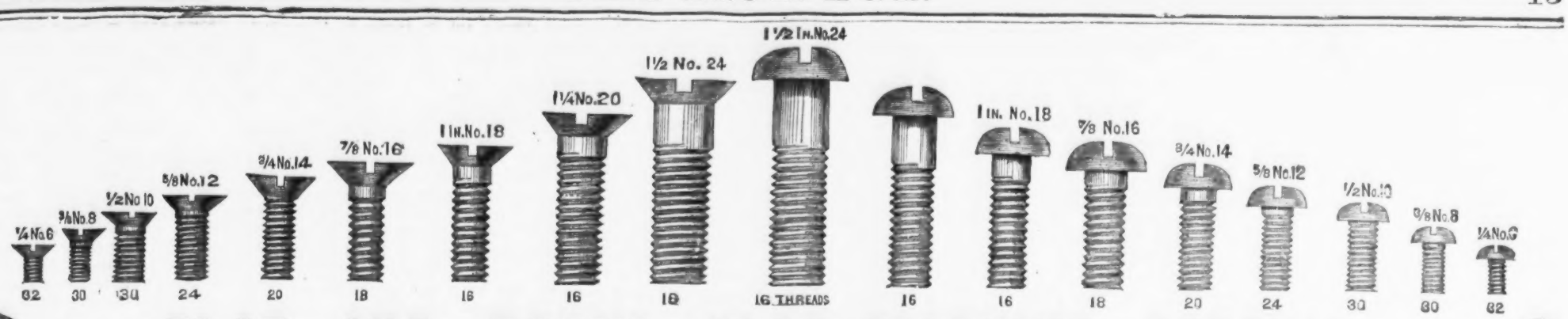

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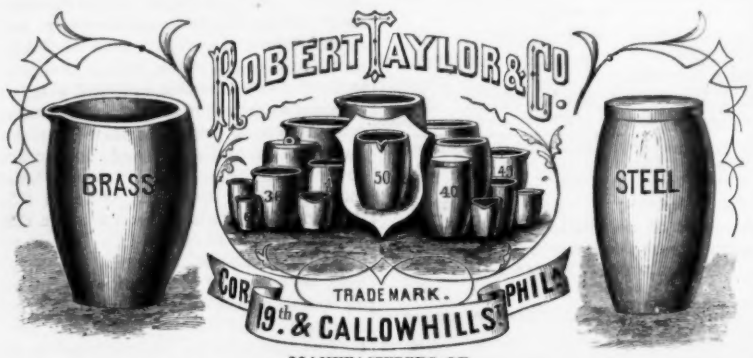

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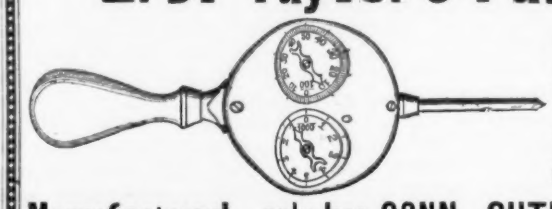

To ascertain the number of revolutions made by a shaft in any given time: Take the Indicator by the handle in the right hand, holding your watch in the left, press the point of the spindle gently against the end and center of the shaft. To every hundred revolutions of the shaft the Hundred Pointer will make one revolution, while the Thousand Pointer will indicate one number, the dial being marked into ten parts. It may be applied to a shaft revolving either to the right or left.

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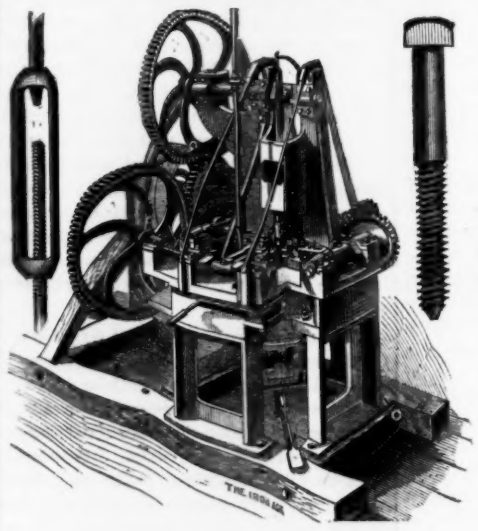

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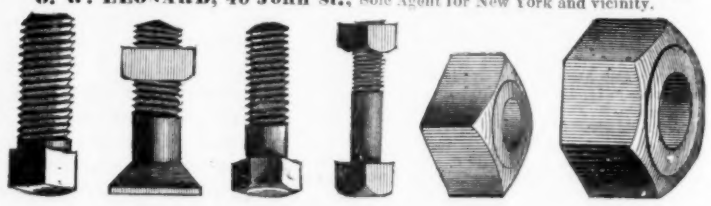

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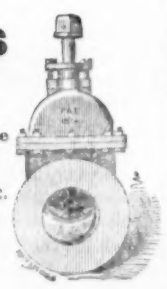

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The Iron Age.

New York, Thursday, July 23, 1874.

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Twenty-seventh Page.—New York Wholesale Prices (concluded).

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Thirty-third Page—Chicago, Boston, and St. Louis Hardware and Metal Prices.

Manufactured Iron.

In an article on the state of the iron market, in a recent issue, we congratulated the trade upon the absence of anything like general demoralization. For this there was, and is, ample warrant in fact. As the rule, makers and manufacturers of iron have accommodated themselves to circumstances, and have made every effort to tide over the season of long protracted prostration as easily as possible. Production has been generally curtailed, expenses reduced and unnecessary risks avoided. As a consequence, we have had few failures, and it is by no means likely that we shall have as many as was generally feared. An exception must be made in the case of the Western manufacturers of bar iron, however, for they have not only been badly demoralized themselves ever since the panic, but have done much to demoralize the whole trade of the country. To what extent this was necessary, and to what extent it could have been avoided, we are not prepared to say. Probably a great many weak concerns have not dared to stop, even though running at a loss, and have kept on in the very natural hope that a turn for the better would soon be reached. Certain it is, however, they have kept on making iron and selling it far below the cost of production, say 2·3c. to 2·5c. Unable to dispose of all their iron at home, they have forced it on the Eastern market, and the Eastern mills have had to choose between the alternatives of meeting these ruinously low prices or stopping altogether. Very many have chosen the latter course, deeming it better than to make iron at prices which, if continued long enough, could only result in bankruptcy. We think it safe to say that, under existing conditions, no Eastern mill can make a good quality of bar iron under 3·3c. without loss, and the sacrifices which the Western mills have made to unload their surplus production in the Eastern market under 2·5c., must have been enormous. On what they have sold in the West they have probably done somewhat better, owing to the more liberal scale of extras charged in that section, but the net result of their business since the panic has been a heavy loss, under which many of them are now staggering.

There may be, as we have said, some allowance to be made for the mistakes of judgment which prompted such a course, but there will be none for persistence in it. We are in receipt of information from many sources, which leads us to believe that the mill owners, West as well as East, have reached the conclusion that they have done business at a loss long enough. A careful examination reveals the fact that the iron sold at such ruinously low prices has largely gone into consumption, which warrants the belief that the mills could have at least covered themselves had they adopted a wiser policy: and there seems to be a feeling among mill owners that the time has come when a little more firmness and moral courage could be exhibited with advantage. We congratulate them upon the discovery. After nine months of depression, there are evidences of a recovery, which are too apparent to be mistaken. A better inquiry for manufactured iron is reported, and with the return of general commercial activity this will steadily increase, until it attains the proportions of an average consumption. There is no present danger of competition from abroad, although the tendency seems to be toward lower wages in England, and by judicious management the American manufacturer can probably retain in future a practical monopoly of the home market. Such is the situation, and they are called upon to choose between two alternatives: either to continue the reckless policy they have followed from choice or necessity since the panic, or to agree among themselves not to do business unless they can at least make it cover cost. Assuming that 3·3c. is the lowest average price at which our mills can sell good iron without loss, that price should, by mutual consent be adopted as the minimum at which they will sell. If all the iron that has been rolled since the panic, speaking generally, has gone into consumption, it proves the existence of a steady demand which certainly justifies the mills in making an effort to get at least cost for the iron they sell? To accomplish this the easiest—and, indeed, the only—way is to make no iron except upon orders, and to take no orders at prices which will not cover cost. To continue the present course would be worse than folly on the part of manufacturers, and we are glad to have reason to believe that they have generally reached this conclusion. The advance which the course we have suggested would inevitably bring about, would do more than anything else to stimulate the demand and advance prices still further, and in a very short time the mills would be making a moderate and legitimate profit. A rising market, however slowly it may rise, is always certain to insure a good business, while such a market as that we are now compelled to report ruins those who sell and frightens those who buy. If there ever existed a necessity for slaughtering the prices of manufactured iron it certainly exists no longer, and we have no hesitation in saying that the commercial outlook fully warrants manufacturers in taking a firm stand for cost, if not for a profit.

The Protection of Cities from Conflagration.

The destructive fire in Chicago, a full account of which we published in our issue of last week, is calculated to again attract public attention, for a brief season, to the importance of protecting cities against the danger of conflagration, by intelligent building and trade licensing ordinances, rigidly and impartially enforced. The man who, in a rural district and remote from any other structure, builds a house to live or do business in, has a right to build as he may choose. If his house burns the loss falls upon him alone, and the conflagration which his carelessness has invited does not extend to the property of his neighbors. In crowded cities, however, the case is different. The man who builds a house within the corporate limits of a city, or even in a large town, cannot so isolate himself that a fire which destroys his house shall not imperil the safety of his neighbors' property, and laws which would be onerous and burdensome to the dwellers in rural districts, are necessary in cities where so much more danger is to be apprehended from conflagration. This necessity was recognized long ago, and in nearly all cities ordinances have been enacted requiring builders to observe certain general precautions calculated to diminish the danger of wide spread conflagration. But this is not enough. Even if our building laws were enforced, which they are not, countless sources of danger are allowed to remain unforbidden and unmolested. Throughout the city are thousands of wooden sheds used as stables, filled with hay, straw and other highly inflammable materials, and surrounded by board fences communicating with the wooden rear porches of dwellings. In the rear of nearly every retail grocery in New York such a stable may be found, and conflagrations originating in such shanties are of frequent occurrence. Of course, stables are as necessary as horses, and they could not be forbidden without inflicting heavy loss upon, or causing serious inconvenience to, many persons who could not conduct their business without the aid of horses; but it is only right and proper that the law should require stables within city limits to be constructed with some regard to fire-proof qualities—so far, at least, that a fire which might break out in them should be prevented from spreading until the means of extinguishing it could be procured. Such stables should all be of brick or stone, with incombustible roofs of iron or other fire-proof material.

There are also permitted within the limits of this and other cities wooden buildings of various kinds and for various purposes. This is prejudicial, if not fatal, to safety against conflagration, and it would be an economy to condemn all such buildings, and, compensating the owners, require them to be pulled down. Again, many kinds of manufacturing, and many dangerous branches of business, are allowed to be carried on in this city without any official supervision whatever. In the district occupied largely by dealers in petroleum and its products the utmost recklessness is manifested in storage, handling and packing, and even the simplest precautions of safety are neglected in order that expenses may be saved and profits increased. Millions of gallons of the most explosive and highly inflammable liquids are constantly kept in store in buildings so long used for the purpose that every timber and plank is saturated with the leakage and waste. These are matters which demand immediate regulation by law, and by longer tolerating such evils in the most crowded parts of our city, we are only inviting the disaster which must sooner or later overtake us.

We are of the opinion that the time is not far distant when public opinion will demand that all buildings erected within the limits of cities shall be made fire-proof—or enough so, at least, to make them effectual barriers to the spread of conflagration. But it is not necessary that we should wait until costly and bitter experience teaches us the necessity for great reforms, before we give our attention to the correction of those evils which are a perpetual menace to the safety of life and property. Experience has taught us that we cannot be too careful in protecting our property from the flames, and public opinion will sustain the enforcement of any laws calculated to give security against a repetition here of the frightful calamities which have befallen other cities.

These considerations naturally suggest themselves to every thoughtful person who reads accounts of fires in cities which sweep away property to the value of millions of dollars, but by far the most important lesson of such an event is apt to be overlooked altogether. Why are men so careless that they need to be required by law to guard against fire? To this there is but one answer—it is cheaper to insure against loss than to adopt measures of safety, and we do not hesitate to say that our system of fire insurance is fraught with danger to the community. For a very large proportion of the losses from fire the insurance companies are responsible, from the fact that they have fixed rates at which they will assume the responsibility for carelessness which it is within their power to prevent. In the competition for business, our fire insurance companies are apt to forget their duty to their stock-holders and policy-holders, and there is no risk, however hazardous, which cannot be placed somewhere for considerably less than the cost of guarding against danger from fire. For this recklessness the insurance companies can offer no reasonable excuse. The object of insurance should be not so much to distribute losses as to prevent them; and in justice to those whose money it accepts in the form of premiums, a company should insist, as the condition upon which it assumes and carries a risk, that buildings insured shall be made safe, and that every reasonable precaution against fire be taken. We know of instances in which warehouses, containing stocks of highly inflammable merchandise, are left absolutely unguarded at night, and without even the provision of a pail of water with inreach to quench a fire occurring during business hours. Why this carelessness? The answer is easily found. The buildings and stocks are heavily insured, and it is cheaper to depend upon the companies for indenmity than to build fire-proof structures, provide fire extinguishing apparatus, extend water pipes around each floor, and employ trustworthy watchmen at night. By permitting this shifting of responsibility upon themselves, and, through them, upon those who pay premiums, but who by prudence and care avoid losses, the insurance companies are responsible in great part for many, if not most, of our conflagrations, great and small; and not until they have learned that it does not pay to insure carelessness on any terms will the community derive from the system any benefit. There are some companies which decline extra hazardous risks, and such companies are usually a safe dependence, except when, as in the case of Chicago and Boston, they suffer from the recklessness of others; but so long as there are any willing to insure the careless and negligent against the consequences of carelessness and negligence, so long will the system be an evil, rather than a benefit to the community.

Our Foreign Commerce.

The statistics of the imports and exports at this port during June, and since the beginning of the calendar and fiscal years, present some interesting comparisons. From these it appears that the total coin value of the goods entered at the port during June was $32,987,776, against $29,147,536 in June, 1873, and $30,653,552 in June, 1872. The following table shows the movement in detail :

FOREIGN IMPORTS AT NEW YORK FOR THE MONTH OF JUNE.

	1872.	1873.	1874.
Entered for consumption	$9,769,316	$10,797,542	$13,011,657
Entered for warehousing	17,913,638	10,936,539	11,403,659
Free goods	2,926,874	6,463,401	8,384,104
Specie and bullion	43,724	950,051	188,356
Tot. entries at port	$30,653,552	$29,147,536	$32,987,776
Withdrawn from warehouse	7,584,971	8,972,544	7,732,285

For the half year ended with June the movement of imports is shown as follows:

FOREIGN IMPORTS AT NEW YORK FOR THE SIX MONTHS FROM JAN. 1.

	1872.	1873.	1874.
Entered for consumption	$108,754,644	$94,888,863	$90,222,199
Entered for warehousing	106,288,001	71,973,195	65,490,757
Free goods	16,960,413	51,394,219	60,349,400
Specie and bullion	777,578	2,791,710	2,510,650
Total entries at port	$232,780,636	$221,047,987	$218,573,006
Withdrawn from warehouse	64,053,390	63,842,256	57,071,631

The total value of importations during the fiscal year ended with June is $396,090,810, against $420,385,032 for the year ended with June, 1873, and $415,808,912 for the year preceding, as follows:

FOREIGN IMPORTS AT NEW YORK FOR THE FISCAL YEAR ENDING JUNE 30.

	1872.	1873.	1874.
Entered for consumption	$212,397,830	$183,084,637	$165,478,543
Entered for warehousing	171,011,048	137,829,234	116,407,703
Free goods	30,015,900	91,862,826	95,880,058
Specie and bullion	2,384,134	7,608,335	18,324,506
Total entries at port	$415,808,912	$420,385,032	$396,090,810
Withdrawn from warehouse	126,516,331	153,872,771	113,783,469

The total importations of the past three fiscal years are shown in the following table:

TOTAL IMPORTS BY MONTHS FOR THE FISCAL YEARS ENDED JUNE 30.

Months.	1871-72.	1872-73.	1873-74.
July	$31,041,171	$37,136,235	$31,173,076
August	38,403,205	42,987,085	32,716,178
September	33,342,255	36,379,008	30,648,996
October	30,645,757	30,919,698	37,145,783
November	24,137,720	23,805,522	24,143,750
December	25,453,168	27,098,505	21,682,360
January	35,6?9,496	38,793,691	30,310,679
February	38,2 6,143	38,860,517	35,439,646
March	39,218,268	43,440,621	42,599,446
April	46,443,937	37,179 426	40,764,927
May	42,579,240	34,616,191	36,470,532
June	30,653,552	29,147,536	32,987.766
Total	$415,808,912	$420,385,032	$396,090,810

RECEIPTS OF CUSTOMS AT THE PORT OF NEW YORK.

Months.	1871-72.	1872-73.	1873-74.
July	$11,934,957	$7,251,160	$10,008,929
August	15,932,839	19,335,157	13,023,085
September	15,733,891	13,274,126	10,959,723
October	12,066,671	10,655,391	7,656,386
November	9,365,044	7,274,100	5,588,338
December	8,044,777	6,603,158	6,298,958
January	13,317,086	10,763 626	10,042,081
February	14,710,928	12,893,638	10,186,365
March	14,095,994	12,101,275	10,793,723
April	13,948,999	9,826,491	9,596,771
May	10,806,489	8,862,528	8,369,597
June	6,943,233	7,533.958	7,899 243
Total	$147,900,888	$126,374,608	$110,423,199

From the statistics of exports we learn that the value of goods shipped to foreign countries during June last exceeds that of the exports of June, 1873, by $5,275,000, and of June, 1872, by $3,725,000. The following shows the movement in detail for the month of June of the present and past two years :

EXPORTS FROM NEW YORK TO FOREIGN PORTS IN THE MONTH OF JUNE.

	1872.	1873.	1874.
Dom. produce	$19,048,152	$23,225,558	$28,275,416
For'n mdse free	97,264	106,465	247,428
Do. dutiable	946,144	1,111,303	725,265
Specie and bul'n	12,538,202	6,655,996	7,106,958
Total exports	$32,629,762	$31,099,322	$36,355,067
Do. excl. specie	20,091,560	24,443,326	29,242,109

For the past six months we have $173,050,275 as the total exportations during that period. For the same time last year the total was $167,307,165, and in 1872 was $143,573,382. The following shows the movement in detail for the first half of the present and past two years :

EXPORTS FROM NEW YORK TO FOREIGN PORTS FOR SIX MONTHS FROM JANUARY 1.

	1872.	1873.	1874.
Dom. produce	$100,442 308	$133,403,183	$138,165 775
F'r'n free goods	679,087	1,256,069	1,146,252
Do. dutiable	5,387,088	4,828,629	4,119,582
Specie & bul'n	37,114,899	27,819,284	29,618,666
Total exports	$143,573,382	$167,307,165	$173,050,275
Do. excl. specie	106,458,483	139 487,881	143,431,609

The total value of goods exported from this port during the past fiscal year amounts to $354,648,806, against $332,573,520 last year, and $285,488,596 in 1872. The following table shows the exports, monthly, during the past three fiscal years :

TOTAL EXPORTS (specie included) FOR FISCAL YEARS ENDING JUNE 30.

	1871-72.	1872-73.	1873-74.
July	29.103,324	37,309,676	35,660,146
August	22,211,824	23,049,891	26 542,058
September	29,993.623	21,137,433	27,301.667
October	24,443,118	29,854,291	33,354,265
November	21,357,196	28,489,169	31.041,724
December	21,806,176	25,424,896	27,884,149
January	20,491,566	27,178,538	26,116,146
February	18,887,826	24,809,446	23.706,473
March	19,243,623	25,552,641	25,417,040
April	21,?89,302	29,470.608	25,768,301
May	30,731,503	29,196.609	35.657,248
June	32,629,762	31,099,322	36,355,067
Total	$285,488,596	$332,573,520	$354,648,806
Ex. of specie	26,062,773	269,918,994	347,535,848

This statement is very satisfactory, especially as regards the growth of our export trade. As will be seen by a comparison of the totals of imports and the totals of exports exclusive of specie, we are rapidly approaching the time when we shall pay for what we bring in with what we send out of our own productions.

Scientific and Technical Notes.

Naval Science, in an article on the

STRENGTH AND STRAINS OF IRON SHIPS,

says: The stress on the deck bottom and sides of the ship, regarded as the corresponding members of the box girder, will in every case be simply the bending moment divided by the depth of the ship; hence the stress will in all cases be directly as the cube of the length, directly as the breadth, and inversely as the depth. The total sectional areas of the deck, the bottom, and the sides, must be proportional to the stress; and as the structural weight may be taken as proportional to these sectional areas multiplied by the ship's length, it must be regarded as proportional directly to the fourth power of the length, directly to the breadth, and inversely to the depth. Whence follows the remarkable result that whether a ship be enlarged by increasing her three dimensions in the same ratio so as to enlarge her displacement in the cube of that ratio, or by increasing her length only so as to enlarge the displacement in that ratio simply, the increase of structural weight will be as the fourth power of the enlargement of dimension. So far, then, as the total dead weight of a ship's hull depends on her requirement for structural strength, a ship enlarged in length only is most unfavorably circumstanced in comparison with one enlarged in all her dimensions alike, and the first cost must be affected by the same condition.

Work on the Goschenen side of

THE ST. GOTHARD TUNNEL

was advanced 82 metres during May, and on the Airolo side by about 45 metres; total, 127 metres. By the end of May, 1823·40 metres altogether were accomplished, and on the 8th inst. 1840 metres. The progress at the Goschenen side was very satisfactory, considering the continuing hardness of the rock. In consequence of an accident by which several men were killed, the works were for a time almost interrupted, having a considerable influence on the advance of the work. An investigation has shown that the accident was due to a want of caution on the part of the unfortunate men. The three wounded are reported almost out of danger. On the Airolo side the works are very much hindered by the great influx of water. The low result of last month is, however, also attributable to sickness among the more skilled workmen, and to the extraordinary tenacity of the rock, which resists sometimes even dynamite. The hornblende and gneiss formation encountered, though it was calculated that they would be met with, are not of great thickness, but they will be struck again. The results obtained during the last week of the month were somewhat better, and there is no reason for supposing that in Airolo also better progress will not soon be made. By the end of this month a sufficient number of the improved McKean boring machines, at present only partially employed, will be ready, and they will then be exclusively employed in the works of the tunnel.

A correspondent mentions the following facts about the

NATIVE GUN MAKERS OF NORTHERN INDIA.

A blacksmith of ordinary skill at Loodiana is said to turn out capital Boxer cartridges, while the iron workers of Sealkote can convert an Enfield into a Snider with the utmost correctness. In one instance the "job" was so neatly done that it was difficult to detect the difference between a government weapon and that altered by the village blacksmith. And yet the whole of the breech piece, including springs, was made at Sealkote. The rifle was sent to Calcutta for Lord Mayo's inspection, and Col. Norgate offered to convert any number of thou-

sands of Enfields within a given time at 3 rupees 8 annas each. After some deliberation, however, the government considered that, though the work was remarkably cheap and solid, yet for political reasons this was a branch of industry not to be encouraged in native subjects, and the matter accordingly dropped. There is a gun maker at Mean Meer, who produces long rifles which fire with greater accuracy up to 900 yards than any arsenals supply. This worthy armorer is driving a great trade among the Khans and Kheyls of his neighborhood.

The Russian government have adopted a new projectile, which has been given the somewhat unmusical name of

THE SCZAROCH.

During the course of late artillery improvements it has been found necessary—in order to obtain long range or high initial velocity of projection—to adopt a form of shot of a cylindrical shape, suited to fit the barrel of a rifled gun tightly. This elongated form of projectile has now almost universally superseded the old spherical form of shot. There is, however, one peculiar property of the spherical shot that is sadly regretted as being lost by the use of cylindrical shot. This is the power of ricochetting—a most deadly form of fire to massed troops. About two years ago a Russian officer invented a novel shot, which combined the deadly power of both rifled and smooth bore shot and shell. It has both the range and piercing effect of a rifled cylindrical shot, the capability of being fired either as a time or percussion shell, and further combining with this the effect of ricochetting spherical shot. The Sczaroch is an elongated shot, of which the head, instead of being hemi-spherical or conical, is an almost complete sphere. This spherical head is attached to the cylindrical body by a comparatively frail attachment. The cylinder is fitted as in ordinary shot with studs, or with a lead envelope, in order to give it a long range and good piercing effect. At the moment of firing, the shot leaves the cannon as an ordinary cylindrical projectile, but if fired as a shell the cylindrical portion only is blown into fragments at percussion or at the intended time, the spherical head being disconnected intact, continues its course as a ricochetting shot, many hundreds of yards further. The great advantage such a shot would give in an artillery duel, for instance, is evident. The shell portion would scatter death among the artillerists upon striking the guns or ground, while the spherical portion would carry destruction into the columns of infantry, which are usually massed in the background as supports. Upon a line of battle, also, the effects would be equally destructive, since not only the first line, but the second, and even the reserves, would all feel the effects of each single shot. It seems, as a consequence of the latest experiments with this shot, that the commander-in-chief of the Russian artillery has ordered the Sczaroch only to be used for field pieces of calibres four to nine.

In a code of instructions looking to the better

PRESERVATION OF IRON SHIPS,

the British admiralty lately directed that unslaked lime be placed in boilers which could be kept empty, and in those cases where they were liable to leakage from the sea, by filling them with a solution of lime in sea water. The result of the experimental application of the solution of lime has been so satisfactory that its use is to be extended to iron and composite ships under the circumstances described in the following circular, No. 36, of 1874, lately issued by the admiralty. "Experiments having shown that the destructive action of bilge water on the iron frames, &c., of iron and of composite vessels may be reduced or altogether obviated by the use of lime, my Lords Commissioners of the admiralty are pleased to direct that in all cases where it may be found impossible to dry out completely any of the compartments, bilges or wings, in order to coat them with composition, paint or cement, as prescribed by circulars 28, of 1872, 22, of 1873, and 31, of 1874, lime well slaked is to be placed in the water contained in such places. As unslaked lime would injure coatings of composition, paint or cement, care is to be taken that the lime used is thoroughly slaked."

A few days ago, in this city, some experiments were made in

DUPLEX TELEGRAPHY,

with most satisfactory results. The original objection to the Morse system was that the transmission of a single message occupied a wire entirely. And though electricians were convinced that a different result could be attained, no one showed how it could be done until so recently as three years ago, when Mr. J. B. Stearns invented the duplex apparatus. That was the second great step, and it instantly doubled the capacity of every wire which even had been erected. By the Stearns process two messages can be sent simultaneously on a single wire in opposite directions between any two terminal points. But this system, like the Morse, had its objection—the message could not be dropped at any way station except by the use of a repeater. Nevertheless, the invention was recognized as of immense practical importance throughout the world. The third and latest improvement is greater than either of the others, since it admits of the simultaneous transmission of four messages at once on one wire, and either message can be dropped at any way station on the circuit. Nor is this all. The old duplex system can be applied to the new invention, and by the combination four messages can be sent simultaneously over the same wire in opposite directions between any two terminal points. And not the least recommendation of the discovery is, that it calls for no changes; the old Morse key is used, without the need of any new class of operators (as in the automatic telegraph), and with no duplication except as to parts of machinery. The invention is the result of the joint labors of Messrs. George B. Prescott and Thomas A. Edison. The Western Union Company own the patents and will use the system.

A somewhat unusual accident occurred on the morning of June 1st., which consisted in an

EXPLOSION OF GAS IN THE COAL BUNKERS OF THE IRON CLAD, DEVASTATION,

concerning which we have the following information:

The coal was the ordinary service mixture of two-thirds Welsh and one-third North Country; and it had been put into the ship six days before. The bunkers themselves are water tight, and the bunker lids are constructed to prevent water passing downward by being accurately fitted to coned seatings, and having a ridge, under which is kept a layer of ordinary oil-soaked gasket. The bunker in which the explosion occurred is one of the upper tier, and it had not been opened for something like sixty hours before the accident took place. It appears that early in the morning one of the cook's assistants went to the bunker, took the lid off, sat down on the edge of the hole with his feet in the bunker, lowered a naked light, when—there was a rush of flame, some little noise, and the unfortunate cook was severely burned about the face and hands. Fortunately the explosion was confined to this one spot, and no other damage was done. A careful examination of the coal was made at once, and there was no trace of damp or heating, the coal was perfectly dry and cool. When this and the similar explosion of five years ago in the Minotaur are considered, it appears certain that we are continually liable to a similar danger, and very simply. We have only to shut up our coal for sixty hours, and for aught we know we are boxing up a most dangerous neighbor, increasingly dangerous the longer and the better he is boxed up. In some few ships large tubes are led from the upper part of each bunker into the funnel casing well above the water line; and we think that similar fittings should be applied to all ships where the bunkers are made water-tight. Even where the bunkers are not meant to be water-tight, provision should be made for the constant escape of gas in that or some simpler way.

A correspondent of *Engineering*, writing from Germany regarding

THE WEATHER WASTE OF COAL,

says: It is a well known fact that coals when exposed for a long time to the influence of air, sun, or moisture, lose a certain quantity of their heating value, by changes which take place with their principal component parts, viz., carbon and hydrogen. This is done by the action of atmospheric oxygen, which penetrates the structure of the coal and combines with it, thus forming carbonic acid and water; in fact, the coal to a certain extent undergoes a slow, but constant, combustion. Highly bituminous coal also loses a part of its carbureted hydrogen, which escapes as gas and very often causes explosions in coal ships, when the hold has been held closed for a long time and is incautiously approached with a burning candle. The alteration of exposed coals differs, of course, very much according to their original quality. Gas coals, for instance, yield a much greater quantity of illuminating gas, as they come fresh from the mine, while after an unusually long exposure they may even lose all their hydrated carbon and become anthracitic. It was therefore of great importance to try, by actual experiment, to what extent such deterioration really takes place, as in case that this did not occur to a very great extent it would be convenient to large coal consumers, such as railway companies, gas works, or coke makers, to buy their supply from the mines in summer, when there is less demand and better transport accommodation, and to lay in a large stock for the winter. The German Railway Association had therefore certain quantities of different coals exposed for twelve months, and re-examined, when the following losses were determined:

	Weight. ₱ cent.	Caloric. ₱ cent.	Yield of Coke. ₱ cent.
Pease's West Hartley coking	0·0	0·0	0·0
Glucksburg seam, Ibbenburen	1·4	6·0	4·6
Carl Mine, near Dortmund	...	2·6	2·1
Hibernia Mine, Gelsenkirchen	0·4	0·6	2·1
Constantine Mine, Bochum	0·4	0·4	0·0
Borglohe Mine, Osnabruck	2·0	6·0	0·5

These figures would prove that the losses which were sustained in weight, caloric power, and yield of coke, though appreciable after one year's exposure, are, in most instances, not so great as to counterbalance the profit arising out of laying in stocks at a convenient time. It is probable, however, that these losses will rapidly increase with a prolonged exposure to atmospheric influences. It would be interesting if such experiments were completed by chemical analyses, made after certain intervals, as they would show the gradual changes which inevitably take place.

Like many other valuable arts and processes of manufacture,

TIN GLAZE FOR POTTERY

originated in the East. Stanniferous glazes are found with Egyptian mummies, on the splendid productions of the Persian potter, whose date we can only guess at, and in tiles from the Moorish palaces of Southern Spain. It is, then, to be supposed that this secret lay long dormant among Oriental races, and was revived and communicated to European nations, with so many other half lost arts, by the Arabs and Moors who conquered Spain. Tiles with tin glazes are found in the Alhambra, with a date corresponding to 1300 A. D., and there is no doubt that Moorish potteries were established in this and the following centuries in Spain, in Portugal and in Sicily, and wherever else the Moors had made their settlements. The Moorish potters made a very beautiful ware, known to collectors as Hispano-Moresque, and easily recognizable by the peculiar metallic lustre on its surface. This ware was largely exported from Spain to Italy, insomuch that the finest pieces are to this day found in that country, and not in Spain; and in time the Italians began to set up potteries of their own, and to imitate the Moorish ware. They called their imitations Majolica, or Maiolica—the ancient Italian name of Majorca—either because the Moorish pottery was made there or thence brought, or because the Italians fancied that it was. At first the Italian potters could not compass either the lustre of the Moorish ware or the rich enamel-like glaze of these foreign potters, and their first works were lead glazed, and are known to collectors as half Majolica—"Mezza Majolica;" but toward the end of the fifteenth century they began to imitate the lustred wares. At last they got hold of the great tin secret, and their pottery soon surpassed the Hispano-Moresque wares in beauty. In the Moors' own specialty of lustred wares they were excelled by the Italians, and at the town of Gubbio a mode of imparting lustre of a red color of surpassing beauty was invented—a secret that was never disseminated, and soon lost; and the rare ruby lustred plates of Gubbio are now among the greatest treasures of the art collector.

It is two years since the French special commission on the modification of military equipment adopted the metallic cartridge. The commission has ever since been determining the plan for the

MODIFICATION OF THE CHASSEPOT RIFLE,

to adapt it to the new cartridge. The commission has not had any intermission of its labors, yet it was only last month that by a majority of one it definitely decided the question. The decision applies equally to the equipment of the infantry, cavalry and artillery, which in the French army is armed with carbines. The commission was presided over by Marshal Canrobert, and included Generals Ducrot, Douai, d'Aumale, Ranson and Canu; Colonels Berge, Capdevilie, etc. It had to choose between two systems, and the importance to be attached to the choice will be appreciated when it is stated that the conversion of the million Chassepots which France now possesses is involved in it. One plan was proposed by M. Gras, captain of artillery, the other by a Dutch gunmaker, M. Riaumont. The former was advocated by the artillery, while the latter was rather preferred by the infantry; the chief difference consisted in the spring, for the effects of the discharge in the two systems are almost identical. The range of both varies from 2500 to 3000 metres. At 1800 metres the bullet has force enough left to be flattened against an iron plate. The accuracy of the fire is in both cases very satisfactory. Captain Gras' plan was the one adopted. The intervention of the directors of gun factories, who proved that it was easier and less costly, seems to have turned the scale. As soon, of course, as this became known in the circles interested in these questions, it was alleged that the plan was a mere reproduction of the Mauser plan, and it has been stated that the agent of Mauser's German Gun Factory is about to take legal proceedings on the ground of piracy. The abolition of the bayonet sabre has likewise been determined on in principle, without, however, any definite decision as to the weapon to be substituted for it.

The manufacture, at Woolwich arsenal, of

AN 80-TON GUN

excites considerable interest, the gun being more than twice the size of any one at present in existence. The steel block from which the inner tube, or lining, is to be made, has been furnished by Messrs. Frith, Sheffield, and is believed to be the largest piece of steel ever produced. It is 25 ft. in length and 25 in. in diameter at the thickest end, but is tapered off toward the muzzle, where the strain of the explosion becomes less. It weighs about 12 tons. It will be taken into the turnery, where a couple of large lathes will be employed to smooth its outer surface, after which it will be bored out in the boring mills. The cascable was made by the same firm, and the trunnion piece, which weighs 18 tons, has been manufactured at Woolwich. This is the largest forging ever produced in the Royal Arsenal.

CORRESPONDENCE.

Steel Direct From the Ore.

BALTIMORE, July 18, 1874.

To the Editor of The Iron Age:—Allow us to call your attention to the product of a combination of ore and coal, both found on the same property, one underlaying the other and mined at a minimum cost.

The coal is a semi-anthracite, free of sulphur, 5 per cent. only of ashes, with 83·786 per cent. fixed carbon—*a mineral charcoal!*

The ores are black band (so Welsh miners designate them), kidney ore and hematite, the former two embedded in shales; they lay in smaller and larger veins—7 ft. iron in 14 ft. of shales.

Quantity of *coal* in the upper vein about 5500 tons per acre; a vein some 30 ft. below the one worked is a still thicker one. Of *iron*, probably 20,000 to 25,000 tons (!) per acre.

Our foreman built a small brick square before the bellows, put in roasted ores and coal, fluxed with a little soda, and the result, after several hammerings, was a piece of *steel* hard enough to cut iron. The steel is in our possession.

We gather from friends in the iron trade, that this result may lead us to the belief that *pig steel* may be smelted at the locality alluded to, and no doubt at much less cost than at places where either coal or coke or ore has to be brought from a distance.

The ores are free of phosphorus, the roasted ores yielded 44 per cent. of steel on a former trial in a cupola, when fluxed with borax.

The property abounds with fire clay, brick and potters' clay, sand, building stone, and timber, lies adjacent to a water course navigable to steamer during three quarters of the year, and in the course of the year may be reached by a railroad now built to within four miles of the lands.

The country is healthy; it lies on a high bluff on the Arkansas River; the property has a water front of 2½ miles, and is intersected by a creek, at the mouth of which there is anchorge for any amount of coal and iron you may have to load into barges.

Steel will be the great want of the future, our railroads will be relaid with steel rails, and the bountiful crops of this year will already put them in a position to refit their roads. If our ores and coal produce steel pig, rolling mills will soon follow, and steel rails can be distributed to the roads beyond the Mississippi from our lands on much more favorable terms than if made at Troy or Johnstown.

Should this topic be of sufficient interest to you and your readers, we will cheerfully give further information as far as we have it. There are 1600 acres in our tract of land.

Yours, respectfully, W. DRESEL & Co.

An Open Letter.

To any Manufacturer—MY DEAR SIR: What think you of a joint-stock organization of yourself, employees and neighbors, for a

CO-OPERATIVE RESTAURANT,

in which any person may, on moderate terms, (not in the least cleemosynary), obtain the privilege of lunch, lavatory*, reading room, &c.?

To prevent crowding, neighboring shops may have a different hour of recess.

Had our well meaning "crusading" ladies, of both sexes, invested their time, zeal and money in such, they might have accomplished more enduring results, with less friction and humiliation, than accompanied their impracticable attempt to force things.

An engineer who desires to divert the course of a river, wastes no time in prayer or exhortation, but quietly proceeds to make his short cut, then, at the proper moment, all being ready, a stroke of the pick, and lo! the stream, rushing headlong into the new chanel, ever widening and deepening.

In this place and age one cannot dictate what another shall not put down his throat—*but one can provide something better.*

Such, also, is the way in which the God of Nature works, by counter attraction.

Very truly and respectfully yours,

GEO. H. KNIGHT.

CINCINNATI, July 19, 1874.

Alloying Zinc and Lead.

In reply to the question published in our issue of July 9th, we have received the following letters:

NEW YORK, July 12, 1874.

To the Editor of The Iron Age: Zinc and lead alloy only in small proportions of one or the other, as they have a great tendency to separate. Mattiessen has shown that on mixing equal parts of the metals, and allowing them to cool slowly, they separate into two layers, an upper alloy of zinc with 1·2 per cent. of lead, and a lower one of lead with 1·6 of zinc. These alloys are malleable, but hard, and the zinc may be distilled from them. If cooled very suddenly, perhaps the separation would be less complete, but the mixture would not be a true alloy, or solution of one metal in the other, and would be of uncertain composition. The properties of zinc to separate from lead on cooling is made use of in Parke's process for desilverizing lead, patented about 20 years ago. The lead and zinc are fused together, the alloy formed is subjected to a liquation process, and then the zinc is distilled. The silver is thus separated along with some of the lead, and recovered by cupelling this lead.

I. G. L.

ELMIRA, N. Y., July 13, 1874.

To the Editor of The Iron Age.—In answer to your correspondent regarding the perfect alloy of lead and zinc, I would say they can only be kept mixed in a state of fusion by constant stirring. A perfect alloy, however, can be made of lead, zinc and tin; say, in proportion of 1 of tin, 2 of lead and 4 of zinc or spelter.

Yours, &c., ELI WHEELER.

Narrowing of the Erie and Atlantic and Great Western Gauges.

Now that the Erie and Atlantic and Great Western Railways are practically under one administration, the subject of narrowing the gauge of both roads will soon come up for speedy consideration. When ex-president Watson of the Erie went to England for the purpose of negotiating the $40,000,000 loan, it was announced that the money was to be expended upon the improvement of the road. The improvement was to consist, among other things, of the laying of a third rail, a change of gauge and other work of construction and equipment. Some time ago the engineers of the Atlantic and Great Western Company prepared estimates for the narrowing of their gauge, but as the gauge of the Atlantic and Great Western could not very well be changed unless the Erie was also changed, it was resolved to await the result of the efforts making to unite the two roads by means of a lease. This has how been done, and the only obstacle in the way of a change of the gauge of both roads will be the lack of funds, if the people on the other side do not advance the sum required. The Erie estimates have been published, but the Atlantic and Great Western figures have never appeared before. They are as follows:

ESTIMATED COST—CHANGE OF GAUGE MAIN LINE AND FRANKLIN BRANCH A. & G. W. R. R., 422 MILES.

Labor and material used in narrowing the gauge of the track, at $1400 per mile	$590,800
Changing 133 engines	669,200
Changing trucks of 135 cars, passenger, caboose, etc	16,000
Changing trucks of 3487 cars, freight	100,000
Changing 44 caboo-e	2,000
Changing 150 hand-cars	1,000
Changing 150 truck-cars	1,000
Contingencies	40,000
Total	$1,450,000

The engineers say that the Atlantic and Great Western Railroad Company will be able to spare 40 broad gauge engines, which, if sold, would bring $400,000, and the reduction in number of engines to change would reduce cost of narrow gauging $200,000. If the preparatory work for the narrow ganging of the road be begun on the 1st of May, it is considered probable that the entire road can be narrow gauged on the 1st of August. It is desirable to have the first month's operation after the change of gauge in August, on account of the business of the road being lighter then than at any other time.

* Two swimming tanks for the opposite sexes would be the perfect thing.

Railroads in Default.

The *Daily Bulletin*, of this city, publishes an interesting statement showing the status of the railroads now in default of interest, of which the following is an abstract:

Name of Road.	Obligations in default.	Date of default.	Am't in default.
Alabama Central	1st m 8's	Jan. '72	$1,600,000
Ala. & Chattanooga	2d m 8's	Jan. '71	673,000
Ala. & Chattanooga	1st m 8's	July '72	5,200,000
Atchison & Neb'ska	1st m 8's	Sept. '73	3,750,000
Atchison, Topeka & Santa Fe	1st m 7's	Jan. '74	7,042,500
Wachusta & S. West	1st m 7's gar	Jan. '74	413,000
Atlantic & Pacific	1st l g 6's	Jan. '74	2,945,500
Atlantic & G. W'st'n	1st m.	July, '74	14,414,000
Atlanta & Balt. Air Line	1st m 8's	Jan. '74	2,000,000
Atlantic, Miss. & Ohio	various	Jan. '74	4,870,542
Bur., C. R. & Minn	1st m 7's s f	Nov. '73	5,400,000
Bur. & Southwest	1st m 8's	Nov. '73	2,100,000
Cairo & St. Louis	1st m 7's	Oct. '73	2,500,000
Canada Southern	1st m 7's	Jan. '74	9,000,000
Cayuga Lake	1st m 7's	Jan. '74	800,000
Chesakeake & Ohio	1st m 6's	Nov. '73	15,000,000
Chesapeake & Ohio extension	1st m 7's	Jan. '74	10,500,000
Chester & Tamora	1st m 7's	Jan. '74	660,000
Chi. & Can. South'n	1st m 7's	Oct. '73	2,000,000
Chi., Clinton & Dub.	1st m 8's	Dec. '73	1,500,000
Chic., Danv. & Vin cennes main line	1st m 7's	Oct. '73	2,500,000
Extension	1st m 7's	Oct. '73	592,000
Chic., Dub. & Minn.	1st m 8's	Dec. '73	4,350,000
Chic. & Mich. Lake Shore	1st m 8's	'73	6,150,000
Chic. & Southwest.	1st m 7's	June, '73	1,000,000
Central of Iowa	1st m 7's	July, '73	3,700,000
" "	2d m 7's	Ap'l, '73	925,000
Detroit & Milw'kee	various	'73 & '74	6,656,876
Des Moines Valley	1st m 8's	Oct. '71	1,000,000
Detroit, Eel River & Illinois	1st m 8's	Jan. '74	1,826,000
Det. Hillsdale & Ind	1st m 8's	June, '73	1,170,000
" " "	2d m 8's	July, '73	300,000
Dutchess & Colum.	1st m 7's	July, '71	2,500,000
*Florida	1st m 7's	July, '73	350,000
Fort Wayne, Jack. & S.	1st m 8's	Jan. '74	1,500,000
F. Wayne, M. & Cin.	1st m 8's	Oct. '72	1,800,000
" " "	2d m 8's	Oct. '72	500,000
Gilm., Clinton & Springfield	1st m 7's	'73	2,000,000
Gilm., Clinton & Springfield	2d m 8's	'73	1,000,000
Missouri, Blooming. & W	ex m 7's	July, '74	2,000,000
Missouri, Blooming. & W	2d m 8's	'74	1,000,000
Frederick & Penn.	1st m 6's	Oct. '73	150,000
*Jacksonville, Pen. & M	1st m 8's	Jan. '73	4,000,000
J'sey City & Albany	va. b'ches.	Nov, '73	500,000
Kansas City, St. Jo. & Council Bluffs	various	'73—'74	3,712,500
Kansas Pacific	various	'73—'74	12,343,250
Lake Sup. & Miss.	1st m l g	July, '73	4,500,000
Leav., Lawr. & Galv.	various	'73	5,860,000
Log'nsp't, Crawf. & S. W	1st m 8's	Nov. '73	1,100,000
Macon & Brans'wck	various	Oct. '71	3,800,000
Maysville & Lex'tn.	1st m	July, '73	500,000
*Memphis & Lit Ro.	1st m l g	Nov. '72	1,300,000
" "	2d m	Nov. '72	1,000,000
Mich. Lake Shore	1st m	Jan. '73	880,000
Mich., L. Shore and Western	1st m	Dec. '73	3,500,000
Montclair	various	'73	4,188,000
Monticello and Port Jervis	1st m 7's	Ap'l, '73	500,000
Mo. Riv., Ft Scott & Gulf	1st m l g	Jan. '74	5,000,000
Mo. Riv., Ft Scott & Gulf	2d m	Oct. 1, '73	2,000,000
Mobile & Mont'gry	1 & 2 m 8's	May '73	3,500,000
N. Hav., M'dlet'n & Will	1st m	Nov. '72	3,000,000
N. Hav., M'dlet'n & Will	2d m	Jan. '73	880,000
N. J. Southern	various	Nov. '73	8,540,000
N. J. Midland	2d mort	Jan. '74	1,500,000
N. O., Mob. & Tex.	1st mort.	Jar. '73	8,000,000
N. Y., Kingst'n & S.	1st mort.	Jan. '74	2,200,000
Northern Pacific	1st m lg	Jan. '74	20,000,000
Oregon & California	1st m 7's	Oct. '73	10,500,000
Port Huron & Lake Michigan	1st m gar.	Nov. '73	1,500,000
P'keepsie & East'rn	1st m 7's	Jan. '73	500,000
Phil. & Balt. Cen.	1st m 7's	....	1,500,000
Rockford, Rk. I. & St. Louis	1st mort	Feb. '73	9,000,000
Southern Minn'sota	various	Ap'l, '73	4,592,000
*St. Louis & St. Jo.	1st. mort	May '73	1,000,000
St. Louis & S. Eastern	various	'73 & '74	4,250,000
St. Jo. & Den. City	1st m E. D.	Feb. '73	1,500,000
" "	1st m W. D.	Feb. '73	5,500,000
St. Paul & Pacific	various	'73	26,250,000
St. Louis, Law. & D.	1st m	Ap'l '73	1,020,000
Springfield & Ill. S. East	1st m 7's	Aug. '73	3,400,000
Springfield & Ill. S. East	2d m 7's	Aug. '73	1,000,000
Selma, Rome & Dal.	various	Oct. '70	4,079,500
South Side, L. Isl'd.	various	Oct. '73	1,600,000
Southern Minnes'ta	1st & 2d m.	July, '73	4,592,000
Tol., Peoria & War.	1st m	Dec. '73	1,600,000
Wilm'gtn & Read'g.	2d m	Jan. '74	1,750,000
Wilm'gtn & West'rn	1st m	....	500,000
Western of Alabama	....	Ap'l, '73	1,250,000
Wallkill Valley	1st m	Oct. '73	800,000
Grand total			$335,295,668

About five sixths of these defaults have occurred since the panic. The total amount of bonds on which interest payments are suspended is $335,295,668. In most cases measures are in progress for an adjustment; in several an order of sale has been received from the courts, in the interest of the bondholders; but, in all cases, the proceedings are very slow; which is a great misfortune to all parties concerned, as the properties can only suffer deterioration while held in their present suspense. Very many of the roads are uncompleted, and will require further outlays before they can possibly earn interest upon their bonded debt; and as the further advances have to come mainly from the present mortgages, this fact causes a good deal of delay in reaching a settlement. There is hardly one fully established road on the list; and it was the fact of the companies being in their infancy, and almost without credit for their working operations, that made them succumb so readily under the terrible pressure of the panic. The amount of mortgages above shown to be in default constitutes about 18 per cent. of the entire bonded debt of the railroads of the United States. This very large amount of suspended debt, however, is not to be regarded as permanently unremunerative to the investors. On the contrary, there is little risk in hazarding the prediction that, within three years, the holders of these securities will be receiving regular interest upon three-fourths of the above aggregate of indebtedness. The roads, as a rule, suspended owing to a financial catastrophe which they could not, in their incipient condition, be expected to withstand; and it yet remains to be proved, by their working under fair conditions, whether or not they are the unsound enterprises which public opinion has somewhat hastily pronounced them to be.

* Foreclosed and sold.

The Corner in Scotch Pig.

We take from the Glasgow *Herald*, of the 4th inst., the following article, which is interesting as throwing some light on the pig iron "corner" in that city, and indicating how steady is the foundation for high prices:

Simple Simons from the country, who believe in political economy, and the law of supply and demand, must have been very much puzzled by the reports of our iron market for the last few weeks. Everywhere we hear of no demand for iron. We find that we are running up the stock in store at the rate of about 5000 tons, a sixth or seventh of our usual stock, per week, and at the same time we discover that the price of iron is steadily going up. On the 1st of May the price of pig iron in Glasgow was "74/ cash to-day." On Friday we reported "warrants understood to have been done at 105/ cash to-day, and a very limited business reported at 100/, 99/, 99/6 cash to morrow (Friday), and at 91/ Monday." On Friday the tide suddenly and, to the political economist from the country, mysteriously turned. Our market report of Saturday states that "warrants, which were dealt in this morning about 100/, then 98/, then 96/ for cash to-day, were freely offered in the afternoon down to 80/ for cash on Monday last, and only a limited amount of buying was attracted by this return to more moderate prices." On Tuesday we reported:

"The pig iron market has been very inactive to day; a few transactions were done at 77/6, one month fixed, at 79/ a week fixed, and at 80/6 for cash to-day. Afternoon no business reported, closing sellers at 80/ cash."

Everybody in the trade—everybody connected with the stock exchange—knows pretty well what this means. We added 6000 tons to our stock last week, and 7500 tons the week preceding. The shipments of iron from Scotland have been steadily falling all the year—the decrease since Christmas being something like 120,000 tons. These two facts, a failing demand and an increasing stock, make it easy to see why the price should fall, but in spite of them the price rose steadily all through May and June, till the bubble collapsed on Friday, the last day for the fortnightly account. Half a dozen people, not one of whom perhaps has the least connection with the iron market, have been clubbing their purses, and buying every g. m. b. warrant that came into the market, altogether irrespective of the real demand for iron or the price at which it can be produced. They were able to hold out till the close of last account, and are frightened to go further. Their combination to purchase, of course, induced rival operators, equally without a real interest in iron to sell, and in the course of the see-saw a considerable number of the gentlemen who had sold more than they could deliver have no doubt had to buy back from the persons they had sold to at enhanced prices, in order to complete their bargains. The double game kept the price rising, and every honest consumer who wanted iron, and who had to use only that which is marked as "good marketable brands," had to pay the price to which the speculators had forced the warrants. At length, when the original combination is supposed to have obtained nearly 40,000 tons of the 42,000 g. m. b.'s in store in Glasgow, the price falls like a rocket. The ingenious riggers may manage to get rid of their iron at a good deal less than they paid for it. They will certainly do so if they are unable to hold on a little longer, and if their rivals cease to compete with them in the attempt to burn their fingers. Meanwhile they have made extravagant profits out of any real consumers who needed iron; they have induced the poor miner to stay out in starvation in the belief that the rising price of warrants represented a real demand for the article he was in the habit of producing; they have enabled the iron master to get rid of a little of his production at a price beyond its natural value. But they have turned the Glasgow iron traffic into gambling on a gigantic scale, and in doing so they have brought ruin to thousands.

A very little money and a limited amount even of courage are needed. The amount of iron that may have to be bought to swallow up the entire stock may be calculated at, say 40,000 tons. Let the party of operators be prepared to buy 60,000. The price may rise on them to 100/—the banks will lend men of good credit some 55/ or 60/ per ton on real warrants. The combination need to have the command, therefore, of £120,000 in cash, and they put that sum of money on the table. It is not much to throw for a good stake, and they may win enormously. If they buy cautiously and unnoticed at the beginning, while the price is really as low as iron can be produced for, they risk little, for iron is certain to bring a price not far from that even in a glutted market. If they can tempt rival operators to go in through the higher price ruling and sell them warrants which they have not in their possession, they may empty the pockets of these rivals at every settling day. In the end they *may* find that to keep the rig going they have had to buy much more than they thought they would have needed, and that they hold it at much higher average prices than they meant. But for the time they have the complete control of a limited market, and under contracts the precise article they hold is to many an article commercially vital. Plenty of iron as good as g. m. b. could have been had all through these last two months at 20/ a ton lower—but the operators alone got all but all the g. m. b. into their hands, and they asked for it what they pleased.

Who is to offer the suggestion of a cure? Some people propose that each bar of iron should be a warrant to deliver such and such actual iron. That fence could easily be jumped over by the gamblers of the ring. But the iron makers should look seriously to it. We are not inclined to suggest to them the remedy they should try. They know the state and conditions of their trade best. They know this, also, that rigs are made mainly because they are frequently successful, and that the market, which is often successfully rigged, is damaged to consumer, or producer, or both. Some of the gamblers lose and some of them win, but the gamblers who know how to gamble make money, and the money is made out of the real trader. The market is "knocked to pieces," and real transactions become all but impossible. Who is going to deal, if he can help it, for iron in Glasgow when the price tumbles in a single day from 105/ to 80/ per ton? Who can fail to see that such fluctuations mean ruin to steady trade? Who that has a heart to pity the poor miner, can fail to drop a tear over the half starved existence for a couple of months in tents, which he owes as much as anything else to the original foolishness of Mr. M'Donald, M. P., and to the talents of the ingenious riggers?

The Onondaga Iron Co's Furnaces.

The works of this company are situated in Geddes, about two miles from Syracuse. The Erie Canal lies alongside of the grounds, and affords excellent facilities for shipping by water. A trestle work has been built running from the stock house to the canal, so that cars may be loaded directly from the boats, and be brought conveniently near the elevators. The officers state that they have sufficient orders at present to keep them busy, and that they have been able to dispose of their entire products since the panic. At that time the demand fell off for a while, and about 3000 tons of iron accumulated in the company's yards. Business then began to come in, and the works have been kept in operation, although the stock which accumulated at the time of the panic remains undiminished.

These works have two stacks, one of which rests on six columns each 10½ ft. high and 19 in. in diameter at the base. The mantel is 3 in. thick. Each stack is 60 ft. high, and 15 ft. in diameter at the bosh and 12 ft. at the top. Each has a close top with bell and hopper. Each furnace has five tuyeres. In the case of furnace No. 1, the materials are conveyed to the top by an inclined plane built at an angle of 35°. It has two tracks and a stairway. A double engine, each cylinder having six horse-power, performs the hoisting. It is provided with a drum 3 ft. in diameter, around which a rope makes several turns, the ends of the rope being attached to the cars on either track. While one car is ascending the other is descending. The blowing engine for this furnace was made by J. P. Morris, of Philadelphia, and is a 300 horse-power engine. Its fly-wheel is of cast iron, and is 20 ft. in diameter. It is of the vertical type, its blowing cylinder being above the steam cylinder. The bore of the latter is 3 ft., that of the former 6 ft. The stroke is 7 ft. It drives about 4000 cubic ft. of air per minute.

The pipes which convey the gas from the top of the stack are each 4 ft. in diameter. They are placed within the furnace building and terminate each in large cylindrical reservoirs of equal diameter. The two reservoirs are horizontal, that which supplies the hot blast ovens being over the one which supplies the boiler furnaces. The two are separated from each other by heavy blocks. The boiler house contains two nests of boilers, each nest comprising four boilers. In each nest two boilers are placed above the other two, the latter being mud drums. The upper boilers are each 68 ft. long and 3½ ft. in diameter, the lower are 58 ft. long and 2½ ft. in diameter.

Furnace No. 2 does not stand on columns, the sheeting being continued directly down to the base plate, which is 15 inches under ground. The boiler house and hot blast ovens attached to this furnace are on different sides of the furnace building. The gas for the boilers is brought down in a pipe 30 inches in diameter, which separates into two branches from each of which proceed four 12-inch pipes. Each set of four pipes supplies two gas burners, there being four in all, and each pair of gas burners supplies a nest of three cylinder boilers, there being six boilers altogether. Each boiler is 50 ft. long and 3½ ft. in diameter. On the other side of the building the gas is brought down, and is supplied to the hot blast ovens in precisely the same manner. The blowing engine has a stroke of 6 ft. The bore of the blowing cylinder is 7 ft. Its blowing capacity is about the same as that of the other engine. Its fly-wheel is heavier. The materials are conveyed to the top by a double elevator, the lift being over 70 ft. The hot blast pipe, which supplies the tuyeres in each stack, is 18 in. in diameter, and is covered with asbestos.

The stock house is 300 ft. long, and is built in a curve. It is in reality two houses, the addition for the second furnace being built a few years ago. Tracks enter it, so that the ore or coal can be deposited wherever they are needed. The track connects with branches from the New York Central and Delaware, Lackawanna and Western Railroads. The company has its own engines and ore cars. A stationary engine is used in the works to hoist materials from the boats.

The best ore used in these furnaces is from the Sterling mine, which, it is claimed, yields 55 per cent. at the furnace. They mix with it ores from Port Henry, and Wayne and Clinton ores. The coal is all brought from Scranton. The limestone lies only three miles from the furnaces, and costs the company only 80 cents per ton, delivered at the works. Seventy-five men are employed here at the present time.

Special Notices.

ASA SNYDER,
Scotch and Anthracite Pig Irons.
Also Furnace Agent and Dealer in the following brands of
Cold Blast Charcoal Pig Iron.
Stonewall, Rehoboth, Derr, Callie, Ravenscliff, Cedar Run, Wythe, Eagle, Greenville, Walton, &c.
Office and Yard,
1008, 1010, 1012 & 1014 Cary St., RICHMOND, VA.

Special Notices.

Blast Furnace or Ore Mines.
Wanted.
An active interest in successful Blast Furnace or Ore Mine, and near New York if possible. No experiments desired.
Address, with full particulars, **M. M.,**
Office of The Iron Age, 10 Warren St., N. Y.

BLAST FURNACES.
To any parties or organization contemplating the establishment, management or erection of Blast Furnaces in any part of the country, the subscriber offers his services as a competent practical Furnace Constructing Engineer, in locating or erecting the works, opening mines, and in managing all the details connected with the supply of stock and movement of materials. Has had experience in both Coke and Anthracite Coal. Is a thorough practical draughtsman. Accustomed to laying out all work to be done, and ascertaining cost before doing it. Can give best references. Salary in accordance with the times. Address **X. L.,**
Office of *The Iron Age,* 10 Warren St., N. Y.

MAGNETIC IRON ORE.
Parties owning a valuable magnetic iron ore property of 150 acres on Lake Champlain—over 6000 tons of ore mined during 1873—desire to interest with them parties who can invest enough money to erect a first-class blast furnace. For details, address,
G. G. S., Box 90, New York P. O.

$20,000 to $30,000.
A young business man wants an active interest to above amount in a money making business well established and capable of extension. He seeks either the place of a retiring or deceased partner, or an interest with one whose care and labor are so great that a younger partner is needed; or a share in a business the growth of which makes necessary new partner with additional capital. The advertiser has been brought up in a house well known for its high standing, and for the last few years he has had an active experience in the general management of business. References of the best class regarding personal character, business capacity, etc., will be given. Answers will be confidential, but those omitting name, business, etc., etc., will have no notice. Address, **H. R. C.,**
Office of *The Iron Age,* 10 Warren St., N. Y.

Any house in Wholesale Hardware business requiring an efficient person of long experience in the trade, in the capacity of Salesman, in or out of the store, can be suited, by addressing, **G.,**
Office of *THE IRON AGE,* 10 Warren St., N. Y.

Wanted.
A situation as superintendent of a rolling mill, by a man who has a practical knowledge of Merchant, Guide and Hoop Rolling, also of Puddling. Understands Roll turning, Mill building and repairing. Good reference given. Address,
ALFRED COE,
219 Northampton St., Easton, Pa.

A man with over 20 years' experience in the manufacture of Iron, a thorough, practical draughtsman, Civil and Mechanical Engineer, at present in charge of the construction of a blast furnace in the South, will be open to engagement shortly.
Address, *IRON MASTER,*
Office of The Iron Age,
No. 10 Warren Street, N. Y.

TO INVENTORS.
Patents secured in the United States and Europe, on the lowest terms and very
PROMPTLY,
by **A. V. BRIESEN,** Solicitor of Patents and Attorney at Law in Patent Cases.
258 Broadway, N. Y., cor. Warren St.
Consultation gratis.

EUGENE BISSELL, AUCTIONEER.
By BISSELL & CO.,
Successors to R. T. HAZELL & Co.,
Store No. 94 Reade Street.
Our REGULAR SALES of HARDWARE, CUTLERY, FANCY GOODS, &c., will be held on TUESDAYS and FRIDAYS throughout the season.
CASH ADVANCES made on CONSIGNMENTS without additional charge.

Wanted.
A situation of responsibility by a gentleman of thorough business education. Has been connected with iron and mining interests in the highest capacity as constructing engineer and manager. Has best of references. Manufacturing interests of any kind, present or prospective preferred. Is not afraid of work. An inferior position will be taken. Salary nominal. Address, **S. E. C.,**
Office of **The Iron Age,** 10 Warren St., N. Y.

To Quit Business.
Will sell the best appointed Hardware Store Building in the State of Ohio, with or without stock. Doing a very large and satisfactory trade. No bonus for the trade. Parties purchasing will have a good and satisfactory business from the opening. Property rents at good prices.
For particulars inquire of
JOHN E. BYRNE,
99 Chambers St., N. Y.
JAMES C. JACOBS, Wooster, Ohio.

TO INVENTORS AND MANUFACTURERS
The Managers of the 42d Exhibition of the American Institute, of the City of New York, beg to announce, that the Exhibition Buildings on 2d and 3d Avenues and 63d and 64th Streets, will be open for the reception of heavy Machinery August 17th and for other articles, August 31st, 1874. The Exhibition will be formally opened September 9th.
For particulars, address "General Superintendent, American Institute, New York."

A. C. LESLIE & CO.,
Montreal, Canada.
Iron, Metal & Hardware Commission
MERCHANTS & BROKERS.
Manufacturers or Merchants desirous of doing business in Canada are invited to communicate with the advertisers.

Wrought Iron Turnings.
WANTED.—Fine Wrought Iron Turnings clean and free from grease. Three cents per pound will be paid for any quantity up to one hundred tons. Address **S. H.,**
Office of *The Iron Age,* 10 Warren St., N. Y.

Katahdin Charcoal Pig Iron.
O. W. DAVIS, Jr., Manufacturer, **Portland, Me.**
Furnace in Piscataquis County, Me., for Car Wheels, Steam Cylinders, Boiler Plates, Hydraulic Presses, Plows, Chilled Rolls, and any purpose requiring great strength.
South Boston Tests, Katahdin Pig Iron.
No. 2, density, 7·202; tensile strength per square in., 19,894
No. 3, " 7·243; " " " 26,928
No. 4, " 7·295; " " " 30,755
Shipped by rail or water from Bangor or Portland.
Samples and analyses furnished on application.

Special Notices.

WM. E. TANNER & CO.,
Metropolitan Works.
Manufacturers of
Steam Engines, Boilers and other MACHINERY,
Canal St., from 6th to 7th, Richmond, Va.
In addition to a full line of new engines, boilers, saw mills, and other machinery of our own manufacture, we have now on hand and will sell at very moderate rates, the following lot of **second-hand machinery,** viz.:
3 Double Hoisting Engines, suitable for mining, tunnelling or other purposes. Each of these engines has two cylinders, 7½ in. diam. by 18 in. stroke; two drums, 4 ft. diam. by 4 ft. long; geared to engine in proportion of 8 to 1, and are provided with disconnecting gear and friction brakes.
One 150 Horse-Power Stationary Engine, with heavy fly wheel, all complete, and nearly as good as new.
Three Return Tubular Boilers, (70 three inch tubes each), 15 feet long, complete with steam drum, fronts, valves, grates, &c., suitable for the above engine.
One 10 Horse-Power Portable Engine of our own make, complete, with two driving pulleys, "Judson" governor, &c., nearly new, and in excellent order.
One 30 Horse-Power Portable Engine, with circular saw mill, saw and belt complete, in first rate order.
Three 4 Horse-Power Stationary Engines. Cylinder, 4 in. by 10 in.
One 30 Horse-Power Stationary Engine, as good as new, complete, with "Judson" governor, fly wheel, &c.
One 30 Horse-Power Stationary Engine, in good running order, but not as new as the above.
One 16 Horse-Power Stationary Engine, with new vertica lboiler.
One Otis Hoisting Engine, in good order.
Two Flue Boilers, 26 ft. long, 42 in. diam., each with two 14 in. flues, iron front, grates, &c., in good order.
One Flue Boiler, 34 ft. long, 48 in. diam. with two 14 in. flues, about as good as new.
One 7 Horse Portable Engine, of our own make, used only a few months, and in perfect order.
Two No. 6 Sturtevant Blowers. Two No. 4 McKenzie Blowers. One No. 6 Andrew's Centrifugal Pump. One No. 6 Turbinate Centrifugal Pump. Three No. 0 Cameron Pumps. One No. 2 Cameron Pump. One Knowle's Pump. One Earle Pump.
Thirty Brass Tubes, 1¾ diam., 12½ ft. long.
Send for illustrated catalogue and Price Lists.

This month a well known firm of Engineers and Machinery Agents, with large connections at home and abroad, will open a ground floor warehouse, having windows fronting Queen Victoria Street and Cannon Street, City, London, England. The firm is prepared to accept the agency for special machinery, tools, &c., and to exhibit a choice selection of these, and of working models. Advertisers' travelers canvass Great Britain and the whole of Europe. For terms, apply to *W. P. L.,*
Office of The Iron Age, No. 10 Warren St., N. Y.

A. PURVES & SON,
Corner South & Penn Streets, Phila.,
Dealers in
Scrap Iron & Metals, Machinery, Tools, Shafting & Pulleys, Steam Engines, Pumps & Boilers, Copper, Brass, Tin, Babbit Metals, Foundry Facings. Best Quality Ingot Brass.
Cash paid for allkinds of **Metals** and **Tools.**

THE
CANADIAN BANK OF COMMERCE.
Capital - - $6,000,000, Gold.
Surplus - $1,800,000, Gold.
The New York Agency, No. 50 Wall Street, buys and sells Sterling Exchange, makes Cable Transfers, grants Commercial Credits, and transacts other Banking Business.
J. G. HARPER, J. H. GOADBY, } **Agents.**

To the Trade.
HARDWARE TRADE REGISTER.
1874
Owing to the backward state of trade occasioned by the late panic, we have deemed it advisable to defer the issue of our Trade Register until a later period than usual in order to give its benefits to the trade of next season.
It having come to our knowledge that certain parties, evidently having no reputation of their own, are endeavoring to trade upon our already established reputation, by assimilating our title, and even, in some instances, from what we understand, using our last edition for canvassing purposes, we respectfully anounce to the trade that we are now canvassing for our next edition, which will contain additional features of interest calculated to make it still more valuable than it already is, and render it indispensable as a work of reference to the trade, **and we ask them to withhold their advertising favors until our agent may call upon them.**
Please Notice that we always have a printed form, bearing our address 4 & 6 Warren St., for orders for advertisements, and that they are payable only to the order of the Manager.
The Merchants and Manufacturers Agency,
(MERCANTILE.)
No. 14 Park Place, N. Y., Publisher.

CAUTION
No advance payments required for regular advertisements; but **all small matter is payable in advance.** And our only authorized agents to collect money are invariably provided with a certificate of authority, bearing our official seal, and signed by the manager, and are instructed always to give our printed receipt stamped with our seal and countersigned by the party receiving the money.
S. W. THOMPSON, Manager.

To Manufacturers.
A young man now employed by a large manufacturing house, and who is well acquainted with the trade, would like to represent in New York one or more manufacturers. Best or references given.
Address **E.,**
Office of *The Iron Age,* 10 Warren St., N. Y.

To Hardware Manufacturers.
An experienced *Superintendent* or *Foreman* acquainted with the manufacture of *Brass* and *Real Bronze* Hardware by machinery, and all details from the foundry to stock room, will be prepared to arrange with responsible parties desiring his services August 1st. Can influence trade and give references as to ability. Address **J. B.,**
Office of *The Iron Age,* 10 Warren St., N. Y.

Special Notices.

THE
SECOND ANNUAL EXHIBITION
OF THE
INTER-STATE Industrial Exposition
OF CHICAGO,
WILL OPEN
Sept. 9th, and close Oct. 10th, 1874.
Special Features for this year are *Machinery in operation* and *Processes of Manufacture.* The largest and best Exhibition Building on the continent. The most liberal arrangements for Exhibitors in every class, and the best and cheapest method for advertising for all Artisans, Manufacturers and Inventors. Space, Steam-Power and Shafting free. Applications should be made, as early as possible, to
JOHN P. REYNOLDS, Sec'y.
CHICAGO, May 25th, 1874.

MANUFACTURERS
desirous of introducing their goods to the **British** and **Continental** Markets, are advised to insert advertisements in the newspaper **"IRON,"** published every Saturday, at *99 Cannon Street, London, E. C.*
SCALE: First 3 lines, 3/; every additional line, 10d. Price, 6d. per Copy, or 30/ per annum, inclusive of postage to the United States.

J. M. WHITE,
Architect and Constructor of Charcoal Blast Furnaces. Plans, Specifications and Estimates of construction furnished upon application.
Office address,
FON DU LAC, WIS.

THE
McHaffie Direct Steel Castings Co.
STEEL CASTINGS,
Solid and Homogeneous, guaranteed to stand a Tensible Strain of 25 tons per square inch. An invaluable substitute for expensive **WROUGHT IRON FORGINGS** or for Iron Castings, where great strength is required. Office, **cor. Tyler and Levant Sts., PHILADELPHIA.**
Send for Circular and Price List.

For Sale, &c.

FOR SALE.
At Lowest Manufacturers' Rates.
GUNS & SHEET ZINC,
Best German and Belgian Brands,
By *LOUIS WINDMULLER & ROELKER,*
20 Reade Street, N. Y.

FOR SALE,
£1. German consular instructions in English, published by subscriber, who *translates* from and into the English, Spanish, French and German. Latest *translations* made for the Spanish Government. Pacific Mail Steamship Co., Walter A. Wood, Morris, Wheeler & Co., Todd & Rafferty, and John T. Dunkin, N. Y.; Wilder & Co., Savannah; and the Tanite Co., Stroudsburg; by
C. K
Commercial Editor "El Cronista,"
Box 2806, N. Y.

20 Horse-Power Root Boiler
FOR SALE,
VERY CHEAP.
Address, **YALE LOCK MFG. CO.,**
Stamford, Conn.

IRON FOR SALE.
Manufactured by the
ULSTER BLAST FURNACE,
NAPANOCH, N. Y.
Samples and prices with,
M. M. PILLSBURY, 85 John St., N. Y.

Valuable Iron Works For Sale.
The undersigned offers for sale the Iron Works in Pottsville, Schuylkill County, Pa., known as "The Washington Works," consisting of a
Large Stone Machine Shop & Foundry,
Brick Pattern House, Erecting Shop, Stone Blacksmith Shop, Brick Office, and Lot of Ground containing in front 195 feet 3 inches, and in depth 260 feet.
There will be sold with the above a large and valuable collection of Patterns, Heavy Crane Flask and Heavy Core Spindles for making heavy Castings and Pipes of all sizes; Turning and Planing Tools.
The Works can be put in immediate operation. A favorable opportunity is here presented for enterprising men. The demand for Castings and Machinery is constantly increasing in this region. The property will be sold on liberal terms. ***If not sold in a reasonable time it will be for Rent.***
For particulars apply to
J. W. ROSEBERRY, Trustee,
Pottsville, Pa.

I AM WILLING AND EXTREMELY ANXIOUS, ON PROPER NOTICE, TO ACCEPT A CHALLENGE FROM H. DISSTON & SONS, OR ANY RESPONSIBLE SAW MANUFACTURER, AND AM READY TO BACK MY WORDS WITH APPROPRIATE DEEDS AND $500 EXPENSE, IF BEATEN.
N. B. WITH HAND, BILLET OR CROSS CUT SAW, $500 ON EACH.
E. M. BOYNTON 80 Beekman Street N. Y.

FOR SALE.
The Harrison Boiler Works,
Situated on the line of the Pennsylvania Railroad, on the Schuylkill River, adjoining the U. S. Arsenal, Philadelphia, comprising all the Real Estate (about 10¾ acres), with Buildings, Factory, Dwellings, Warehouses, etc., thereon, machinery, tools, patterns, drawings, and all the necessaries for carrying on, and the Patent right for, the manufacture of this well known and successful Steam Generator. This establishment is in first-class order in every respect, and has facilities for turning out 300 horse-power of Boilers per week. There is now in use over 50,000 horse-power, with a present steady demand. The shops have both rail and water facilities for shipping, and are in every way well appointed for machine and foundry work in conjunction with the manufacture of boilers.
For further information, address,
Executors of The Estate of Jos. Harrison, Jr., Deceased,
No. 10 North Merrick St., Penn Square, Philadelphia, Pa.

Trade Report.

OFFICE OF THE IRON AGE,
WEDNESDAY EVENING, July 22, 1874.

The past week has been without feature of interest in Wall street, and topics other than financial have chiefly furnished themes for discussion in financial circles. The money market continues easy at 2 @ 3 per cent. on call. Mercantile paper ranges from 5 @ 6 per cent. for prime 60 days to 6 @ 7 per cent. for 4 months.

The gold market has been largely under control of a speculative combination, which has sought to advance the premium on the strength of predictions that the attempt of the Treasury to negotiate the 5 per cent. bonds would fail. Definite information as to the result of these negotiations was expected to-day, but up to the hour of this writing had not been received. The following shows the daily range of the premium:

	Highest.	Lowest.
Thursday	109⅞	109⅜
Friday	110	109⅞
Saturday	110⅛	110
Monday	110⅛	110⅛
Tuesday	110⅛	110
Wednesday	110	109⅞

The bond market has been dull, but firm, in sympathy with gold. State bonds are dull, but desirable railway mortgages are stronger.

The stock market has been without important feature. The principle transactions, which have in no case been large, have been in Lake Shore, Pacific Mail, Erie, Western Union, St. Paul, Northwest and Union Pacific.

The last bank statement shows small changes except in the loan average, which is lower by $1,773,400. The legal tender average rose during the week $518,600, and the specie average $379,900. The banks now hold $28,863,100 lawful money above the reserve required by law, which is a gain of $1,034,000 compared with last week. The following are the averages of the two weeks:

	July 11.	July 18.	Differences.
Loans	$237,088,400	$235,315,000	Dec. $1,773,400
Specie	27,375,400	27,755,300	Inc. 379,900
Leg. Ten.	61,335,100	61,853,700	Inc. 518,600
Deposits	243,525,600	242,983,600	Dec. 542,000
Circ'lation	25,923,700	25,727,500	Dec. 196,000

The following tables show the foreign trade movements for the week:

IMPORTS.

	1872.	1873.	1874.
Total for week	$7,221,302	$6,530,353	$6,358,478
Prev. reported	237,280,986	226,647,911	224,075,999
Since Jan. 1	$244,502,188	$233,178,266	$230,434,477

Included in the imports of general merchandise for the week are:

	Quant.	Value.
Brass goods	7	1,828
Bronzes	28	6,563
Chains and anchors	5	330
Copper		3,180
Cutlery	76	30,361
Guns	16	3,961
Hardware	33	7,421
Iron, pig, tons	241	9,494
Iron, sheet, tons	11	1,493
R. R. bars	1,494	39,508
Iron, other tons	605	16,085
Lead pigs	12,801	85,327
Metal goods	257	18,847
Nails	66	606
Needles	24	5,870
Old metal		3,652
Per. caps	8	824
Saddlery	9	1,455
Steel	1,561	21,250
Tin, boxes	4,839	34,908
Tin, 659 slabs	71,426	17,215
Wire	155	6,385
Zinc	177,748	11,358

EXPORTS EXCLUSIVE OF SPECIE.

	1872.	1873.	1874.
For the week	$4,913,437	$6,529,692	$5,308,096
Prev. reported	115,089,417	150,601,911	158,625,219
Since Jan 1	$120,002,854	$157,131,573	$163,943,315

EXPORTS OF SPECIE.

Total for the week	$484,623
Previously reported	30,945,518
Total since January 1, 1874	$31,430,141
Same time in 1873	35,941,852
Same time in 1872	44,145,011

Government bonds closed as follows:

	Bid.	Asked.
U. S. Currency 6s	117¼	117¾
U. S. 6s 1881, reg.	116½	116¾
U. S. 6s, 1881, cou.	118½	118¾
U. S. 1868, 5-20 reg.	113	113¼
U. S. 5-20 1863, cou.	113	113¼
U. S. 5-20 1864, reg.	114¼	114¾
U. S. 5-20 1864, cou.	115¾	116
U. S. 5-20 1865, reg.	115¼	115¾
U. S. 5-20 1865, cou.	117	117¼
U. S. 5-20 1865, reg. new	115¼	115¾
U. S. 5-20 1865, cou.	116¼	116¾
U. S. 5-20 1867, reg.	115¾	115¾
U. S. 5-20 1867, cou.	117¼	117¾
U. S. 5-20 1868, reg.	116¼	116¾
U. S. 5-20 1868, cou.	117¼	117¾
U. S. 10-40 reg.	112¾	112¾
U. S. 10-40 cou.	113	113¼
U. S. 5s 1881 reg.	111¼	111⅞
U. S. 5s 1881 cou.	112¾	113

The following were the highest and lowest prices of stocks to-day:

	Highest.	Lowest.
N. Y. Cen. & Hudson Consolidated	99¾	99¼
Lake Shore	73¾	73⅛
Rock Island	98¼	98
Del., Lack. & Western	107⅛	107⅛
Wabash	35¼	34⅞
Western Union Telegraph	71⅛	71⅛
Northwestern	57⅛	57⅛
Milwaukee & St. Paul	35⅛	34⅞
Panama	110	110
Pacific Mail	44⅛	44⅛
Erie	31⅞	31½
Ohio & Mississippi	25	25
Boston, Hartford & Erie	1⅜	1⅜
Union Pacific	26⅛	26⅛
C. C. & Ind. Central	17⅛	17⅛
Hannibal & St. Joseph	25	25

GENERAL HARDWARE.

The trade are now beginning to look for the commencement of the fall business, and we find a number of buyers already in town, and hear of good orders received from travelers. It seems to be the general opinion that great changes in prices are not to be expected, as goods are already very low, and the indications of a good fair trade are encouraging.

There is a slight improvement noticeable in the demand for foreign Hardware this week. Prices for leading goods continue firm, and no change of importance have occurred since our last writing." By our English letter it will be seen that the firm of Nettlefold & Chamberlain, the well known manufacturers of Screws, has been dissolved. The business will be continued by Edward, John, John Henry and Frederick Nettlefold, under the style of "Nettlefolds."

The reduction mentioned in the same letter has no application to the price of Screws for the American market. The agency for these goods continues, as heretofore, with Hermann Boker & Co., who are in a position to fill orders promptly from stock. John L. Fisher, No. 116 Duane street, agent for Spear & Jackson, has just received an assortment of Spear & Jackson's new "American Pattern" Hand Saw, which they offer to the trade at $3·55, gold. This Saw is made of the same quality Steel and finish as the well known English pattern, and lists the same. They are fully warranted, and bear the same trade mark as the original Spear & Jackson Saw, with the addition of "American Pattern." The old style Saw can also be furnished at $4·50 to £, gold. Spear & Jackson's Files and Rasps are now quoted at $5 to £, gold, instead of $5·50, as formerly.

Hermann Boker & Co. have recently issued an illustrated catalogue which contains a number of important lists which are for the first time presented to the trade in book form. Among the lists we notice the following: Wade & Butcher's and Wostenholm's Razors, sterling list; H. Boker's Razors' and John Wilson & Sons' Butcher Knives, Steels, &c.; Butcher's Files and Edge Tools, sterling and currency lists, and a great variety of German and English Hardware, Tools, Guns, &c.; also, the well known goods of the Trenton Vise and Tool Works.

There is a better inquiry for Nails this week, and some fair sized orders have been placed. With regard to price there is no improvement to notice, and we continue the quotations of last week, viz.: $3·75 @ $3·90 for 10d.; orders for 100 kegs are easily placed at the former figure. The Brass manufacturers held a meeting in this city to-day, and, contrary to general anticipations, the existing rates were confirmed.

The Pump Manufacturers' Association of the United States held a meeting at Niagara Falls, on the 9th inst. The prices and discounts heretofore ruling were re-affirmed to remain for the ensuing quarter. The proviso for an extra discount of 5 per cent. for a quantity of $250 was repealed, so that it is now necessary to purchase goods to the amount of $500 to obtain an extra discount, which on orders for that amount will be 10 per cent, as previously understood.

H. Chapins' Son, Pine Meadow, Conn., has informed us of the following changes in his discount sheet of 1st inst.:

Boxwood Rules, Catalogue pages 3 to 10, dis. 66⅔ % instead of 60 %.
Gauges, Catalogue pages 55 to 56, dis. 45 % instead of 40 %
Levels, Catalogue page 61, dis. 66⅔ % instead of 60 %
Plumbs and Levels, Catalogue page 62, dis. 66⅔ % instead of 60 %
And the usual 10 % extra discount on all for prompt cash.

Russell & Erwin Mfg. Co., agents for Fisher & Norris, quote Eagle Anvils discount 15 and 10 per cent., instead of 15 and 5 per cent. as formerly.

Markt & Co., No. 139 to 143 Centre street, have just issued an illustrated catalogue of Upholsterers' and Builders' Hardware manufactured and imported by them. Among their specialties we notice a full line of China head and other Picture Nails, Silver, Glass and Porcelain Curtain Pins, Porcelain Shutter and Drawer Knobs, Lava, Wood and Mineral Door Knobs and Lock Furniture. They are also agents for a large manufacturer of German Coil and Halter Chains, Cow Ties, etc., which they offer from stock at lowest market rates. The following are their discounts:

Bright Wire Hooks and Eyes	dis. 70 %
Shutter Knobs, loose screws	50 %
" " fast	45 %
Mineral and Porcelain Door Knobs	50 %
Escutcheon Plates	50 %
" Poppy Drops	50 %
Lava Knobs and Escutcheons	50 %
Bronze " "	50 %
Wooden Knobs and Escutcheons	25 %
Furniture Nails and Disks	15 %
Picture Nails	45 %
" " Brass head	40 %
Curtain Pins	45 %
Porcelain and Lava Picture Knobs	45 %
Brass Molding Hooks	45 %
Tenter Hooks	net
Harness Snaps	40 %
Sash Fasteners	20 %
Wrought Brass Butts	30 %
" Iron " narrow and table	30 %
" " " blind	40 %
Galvanized Wire Clothes Lines	10 %
Coil and Halter Chains and Cow Ties	25 %
Ball Key Chains	net
Round Head Brass Capped Screws	45 %
Flat " " "	60 %
Round Head Silver Capped Screws	35 %
Flat " " "	40 %
Brass Padlocks	20 %
Porcelain Shield and Over Plates	net
" Finger and Drawer Plates	net
" Mouthpieces	35 %
Patent Alarm Whistles	35 %
Speaking Pipe and Elbows	35 %
French Wire Nails	10 %

We publish below the uniform revised lists for Common Stamped and Plain Pieced Tin Ware adopted by the manufacturers at their recent meeting, mention of which was made in last week's issue. The discount from both lists is as previously reported, 5 @ 10 per cent., according to quantity.

COMMON STAMPED WARE, &C.

Bucket Covers.

Qts.	½	1	2	3	4
Inch	4½	5 3-16	6 5-16	6⅞	7 11-16
Per gross	$2·00	2·60	3·40	4·25	5·75
Qts.	6	8	10	12	
Inch	8⅝	9¼	9¾	10 9-16	
Per gross	$7·00	8·00	8·50	11·50	

Cake Box Covers.

	Small.	Medium.	Large.
Inch	11⅛	12⅝	13⅝
Per gross	$15·00	18·00	22·00

Pot Covers.

Inch	7¾	8¼	8¾	9¼	9¾	10¼
Per gross	$5·75	6·00	6·25	6·75	7·25	8·25
Inch	10¾	11¼	11¾	12¼	12¾	13¼
Per gross	$8·75	9·50	10·00	13·00	13·75	16·50

Pie, Dinner or Scolloped Plates.

Inch	6	7	8	9	10	11
Per gross	$4·00	4·50	6·00	6·50	8·50	10·50

Deep Pie Plates.

Inch	9	10
Per gross	$8·50	10·50

Jelly Cake Pans.

Inch	9	10
Per gross	$7·50	10·00

Coffee Pot Covers.

Plain	1¼	2	3	4	5	6 qts.
Inch	3	3⅜	3⅝	4⅛	5	
Per gross	$1·15	1·40	1·60	2·00	2·75	3·00
Rimmed	2¼	3	3⅜	4	4½ inches.	
Per gross	$2·25	2·50	3·00	3·50	4·00	

T. K. Breasts only.

Inch	7¾	8	8½	9	9½	10	10½	11	11½
℔ gro.	$5·00	6·30	6·75	7·25	7·75	9·50	10·00	12·00	13·00

Grater Plates.

Sheet	¼	½	1
Per gross	$3·00	6·00	11·50

Scolloped Cake Pans.

	Small.	Large.
Without Tubes	per gross, $8·00	11·50
With Tubes	" 10·50	14·00

Stamped Square Pans.

No	⅛	1
Per gross	$7·50	14·50

Common Square Pans (One Sheet).

Per gross	$12·50

Milk Skimmers (Plain or Pierced).

Per gross	$4·00

Lettered Plates.

Inch	5½	6
Per gross	$3·25	4·00

Steamer Bottoms.

Add $1 per gross, or 10c. ℔ doz. to list of Pot Covers.

Tin Stove Pipe Rings.

Inch	4	4½	5	5½	6	7
Plain ℔ gro.	$4·50	5·00	5·50	6·00	6·50	7·50
Jap'd or Burn'd "	6·00	6·50	7·00	8·00	8·50	10·00

Coffee Boiler Lips.

	Small.	Large.
To Rivet	per gross, $0·80	1·10
To Solder	" 1·25	

REVISED LIST OF PLAIN PIECED WARE.

Oval Wash Boilers, IX.

Inch	5½	6	6½	7	8	9	10
Per doz.	$15·00	17·00	18·50	20·00	22·50	25·00	30·00

Oval Wash Boilers, XX.

Inch	6	7	8	9	10
Per doz.	$18·75	22·50	25·00	27·50	33·00

Flat Bottom Oval Boilers, IX.

Inch	6	7	8	9	10
Per doz.	$18·00	21·00	24·00	27·00	30·00

Flat Bottom Oval Boilers, XX.

Inch	6	7	8	9	10
Per doz.	$20·00	23·00	26·50	30·00	33·00

Double Pit Oval Boilers, IX.

Inch	6	7	8	9	10
Per doz.	$18·00	21·00	24·00	27·00	30·00

Double Pit Oval Boilers, XX.

Inch	6	7	8	9	10
Per doz.	$20·00	23·00	26·50	30·00	33·00

Oval Range Boilers, XX.

Nos	1	2	3 xxx
Each	$2·25	2·75	3·50

Square Range Boilers, XX.

Nos	1	2	3 high
Each	$2·50	3·50	4·00 4·50

Copper Bottom Tea Kettles, IX.

Inch	5½	6	6½	7	8	9	10
Per doz.	$6·00	6·50	7·00	8·00	10·50	12·00	13·50

Copper Bottom Tea Kettles, XX.

Inch	6	7	8	9	10
Per doz.	$7·25	9·00	11·50	13·50	15·00

Range Tea Kettles.

Nos	1	2	3
Per doz.	$10·50	12·00	15·00

Flat Copper Bottom Tea Kettles.

Qt.	1	2	3	4
Per doz.	$4·50	5·50	6·50	7·50

Copper Oval Boilers, Tin Covers.

Inch	6	7	8	9
Each	$4·00	4·50	5·00	5·50

Copper Tea Kettles, Tin Breasts.

Inch	6	7	8	9
Per doz.	$13·50	15·00	18·00	21·00

Copper Tea Kettles, all Copper.

Inch	6	7	8	9
Each	$2·50	3·00	3·50	4·00

Copper Bottom Coffee Boilers.

Inch	6	7	8	9
Per doz.	$8·00	9·00	11·00	13·00

Steamers.

Inch	6	7	8	9
Per doz.	$4·50	5·50	6·50	7·50

Oval Fish Kettles.

Nos	1	2	3
Inch	16	18	20
Per doz.	$15·00	18·00	21·00

Covered Buckets.

	1 pt.	1 qt.	2 qt.	3 qt.	4 qt.	6 qt.	10 qt.	12 qt.
℔ doz.	$1·20	1·50	1·75	2·25	3·25	4·50	6·50	7·50

Covered High Buckets.

Quart	1	2	3
Per doz.	$1·75	2·50	3·00

Covered Saucepans.

	1 pt.	1 qt.	2 qt.	3 qt.	4 qt.	6 qt.	8 qt.
Per doz.	$1·50	1·75	2·25	3·00	4·00	5·00	6·50

Covered Two Handle Saucepans.

Quart	3	4	6	8	10
Per doz.	$3·25	4·25	5·25	6·75	7·50

Farina Boilers.

Quart	2	4	6
Per doz.	$6·00	7·50	9·00

Batter Pails.

Quart	4	6
Per doz.	$5·00	7·50

Coffee Pots.

Quart	1	2	3	4	6	8
Per doz.	$2·00	2·50	3·00	4·00	5·00	7·50

Coffee Boilers.

	3 pt.	2 qt.	3 qt.	4 qt.	6 qt.	8 qt.
Per doz.	$2·25	2·75	3·25	4·00	5·00	7·50

Copper Bottom Coffee Boilers.

Quart	3	4	6	8
Per doz	$4·50	5·50	6·50	8·00

Copper Coffee Boilers.

Quart	3	4	6
Per doz.	$12·00	13·50	15·00

Octagon Coffee Pots.

Pint	3	4	5	6	7
Per doz.	$4·00	4·50	5·00	5·50	6·00

Octagon Tea Pots, plain spouts.

Pint	2	3	4	5	6	7
Per doz.	$3·00	3·50	4·00	4·50	5·00	6·00

Octagon Tea Pots, fancy spouts.

Pint	2	3	4	5	6	7
Per doz.	$3·50	4·00	4·50	5·00	5·50	6·50

Fluted Tea Pots.

Pint	3	4	5
Per doz.	$5·75	6·50	7·50

Oval Tea Pots.

Pint	2	3	4	5	6
Per doz.	$4·50	5·00	5·50	6·00	6·50

Flaring Tea Pots, copper bottom.

Pint	3	4	5	6	7
Per doz.	$8·50	9·50	11·00	12·00	14·50

Flaring Coffee Pots, copper bottom.

Pint	3	4	5	6
Per doz.	$7·25	8·50	9·75	11·00

Flaring Coffee Biggins.

Pint	1	2	3	4	5	6
Per doz	$9·00	10·50	12·00	13·50	15·00	16·50

Coffee Filters.

Pint	2	3	4	5	6
Per doz.	$9·00	10·00	11·00	12·00	13·00

Tea Steepers.

	Straight.	Flaring.	Black Handle.
Per doz.	$1·50	2·25	2·75

Wash Kettle IX.

Nos	1	2	3	4 xx
Per doz.	$8·00	10·00	13·00	17·00

Common Wash Kettles.

Nos	1	2	2 DX
Per doz.	$7·00	8·50	12·00

Copper Bottom Wash Kettles.

Nos	1	2	3	4
Per doz.	$13·00	17·00	19·00	24·00

Copper Wash Kettles.

Nos	1	2	3	4
Each	$4·00	4·50	5·00	6·00

Dish Kettles.

Quart	6	10	16
Per doz.	$3·50	4·50	6·00

Milk Strainer Pails.

Quart	10	14
Per doz.	$6·50	10·00

Dish Pans, IX.

Quart	10	11	12	14	16	20
Per doz.	$4·50	5·00	6·00	7·00	8·00	11·00

Common Dish Pans.

Quart	10	12
Per doz.	$3·50	4·50

Pieced Pans.

	1 pt.	2 pt.	3 pt	2 qt.	3 qt.	4 qt.
Per doz.	$0·80	·90	1·10	1·40	1·65	1·75
	6 qt.	8 qt.	10 qt.			
Per doz.	$2·50	3·25	3·75			

Oval Pans.

Nos	1	2	3	4
Per doz.	$1·75	2·50	3·00	3·75

Extra Deep Oval Pans.

Nos	1	2
Per doz.	$2·50	4·00

Charlotte de Russe Pans.

	Small.	Large.
Per doz.	$1·25	2·50

Fruit Cake Pans.

	Small.	Medium.	Large.
Per doz.	$2·50	3·00	3·50

Deep Bread Pans.

	Small.	Medium.	Large.
Per doz.	$2·00	2·25	2·50

Square Ringed Pans.

Nos	1	2	3	4
Per doz.	$1·75	2·50	3·00	3·75

Sponge Cake Pans.

Per doz.	$2·75

Deep Sponge Cake Pans.

Per doz.	$2·50

Common Square Pans.

Per doz.	$1·15

Taffy Pans.

Per doz.	$1·40

Oyster Stew Pans.

	Tin Bottom.	Copper Bottom.
Per doz.	$8·50	9·50

Spring Bottom Pans.

	Small.	Medium.	Large.
Each	$ 0·50	·55	·65

Sheet Iron Pans, all sizes.

Per lb	$ 0·16

Dinner Kettles.

	Small.	Large.	Extra Large.
Per doz	$3·50	4·50	7·00

Large Brass Bailed Dinner Kettles.

Per doz.	$5·50

Dinner Kettles.

	3 Story.	4 Story.	5 Story.
Each	$1·00	1·12	1·25

Saulson's Patent Dinner Kettles.

Nos	1	2	3
Per doz.	$8·00	9·00	10·00

Kerosene Cans (screw top).

Quarts	1	2	4
Per doz.	$2·50	3·00	3·75

Kerosene Cans (plain top).

Gallons	1	2	3	5
Per doz.	$3·50	5·50	6·50	9·00

Dippers.

	1 pt.	1 qt.	2 qt.	4 qt.
Per doz.	$1·00	1·25	1·75	7·00

Milk Dippers.

	½ pt.	1 pt.	1 qt.	2 qt.
Per doz.	$2·25	2·75	3·50	6·00

Milk Kettles.

Quarts	1	2	3	4	6	10	12	14
Per doz.	$3 75	5·00	7·00	9·00	10·50	13·50	15·00	16·50

Plain Measures.

	1 gill.	½ pt.	1 pt.	1 qt.
Per doz.	$ 0·60	·75	·85	1·25

Lipped Measures.

	½ pt.	1 pt.	1 qt.	½ gal.	1 gal.
Per doz.	$1·00	1·25	1·50	2·75	4·00
Gallons	2	3	5		
Each	$1·25	2·25	3·25		

Heavy Measures.

	½ pt.	1 pt.	1 qt.	½ gal.	1 gal.
Per doz.	$3·25	4·25	5·25	6·50	8·00

Heavy Measures.

Per set	$2·25

Copper Measures.

Per set	$6·00

Beer Measures.

	Common.	Bottom.	Rimmed.
Per doz.	$6·50	7·00	7·50

Copper Bottom Beer Measures.

Per doz	$10 50

Copper and Brass Beer Measures.

Per doz.	$19·00

Funnels.

	Vial	½ pt.	1 pt.	1 qt.	½ gal.	1 gal.
Per doz.	$0·55	·65	·85	1·50	2·00	3·00

Hooped Funnels.

Per doz.	$4·50

Beer Funnels.

Per doz.	$2·50

Liquor Pumps.

Per doz.	$12·00

Liquor Suckers.

Per doz.	$4·25

Liquor Mixers.

	Small.	Large.
Per doz.	$1·10	1·25

Heavy Scoops.

Nos	1	2	3	4	5	6
Per doz.	$2·25	2·75	3·50	4·50	6·00	7·00

Ring Handle Scoops.

Nos	0	1	2
Per doz.	$0·50	·60	·70

Marking Pots.

	Small.	Large.
Per doz.	$2·25	2·75

Pieced Wash Bowls.

	Small.	Large.
Per doz.	$2·25	2·75

Handled Wash Bowls.

	Small.	Large.
Per doz.	$2·75	3·50

Cullenders.

	Small.	Large.	Extra Large.
Per doz.	$2·50	3·25	7·50

Plain Pudding Molds.

Nos	1	2	3	4
Per doz.	$4·50	5·50	6·50	9·00

Fluted Pudding Molds.

Nos	1	2	3
Per doz.	$10·00	11·00	12·00

Sheet Graters.

Sheet	¼	½	1
Per doz.	$0·85	1·10	2·00

Gravy Strainers.

Nos	2	3
Per doz.	$0·80	1·00

Soup Strainers.

Per doz.	$2·50

Flasks.

	Small.	Medium.	Large.
Per doz.	$1·25	1·50	1·75

Ice Cream Freezers.

Quart	2	4	8	12	16	20
Per doz.	$9·00	12·00	15·00	20·00	24·00	30·00

Cups.

Pints	½	1
Per doz.	$0·45	·70

Cups, Riveted Handle.

	1 pt.	1 qt.	2 qt.
Per doz.	$0·90	1·10	1·75

Biscuit Cutters.

Inch	2½	3
Per doz.	$0·35	·40

Cake Cutters.

	Plain.	Fancy.
Per doz.	$0·40	·50

Muffin Rings.

Inch	2½	3	3½
Per doz.	$0·30	·30	·35

Apple Corers.

Per doz.	$1·00

Common Reed Horns.

Per doz.	$1·00

Screw Top Reed Horns.

Per doz.	$1·25

Plain Candlesticks.

Nos	1	2
Per doz.	$0·70	·65

Deep Candlesticks.

Nos	1	2
Per doz.	$1·35	1·15

Dredge Boxes.

	Small.	Large.
Per doz.	$0·65	·75

Rattles and Whistles.

Per doz.	$0·25

Toddy Kettles.

Nos	1	2	3
Per doz.	$4·50	5·00	5·50

George B. Walbridge, agent for Sidney Shepard & Co., has furnished us with the following revised list for Zinc Stove Pipe Rings:

Inch	5	5½	6	7
Per gross	$10·50	12·00	12·00	15·00

We received last week from Hopkins & Dickinson Mfg. Co. a copy of their illustrated catalogue of Hand Made Locks and Real Bronze Hardware, just issued. This book of one hundred and thirty-seven large pages is beautifully illustrated, all of the engravings being noticeable for the clearness and beauty of their lines. The goods of this company, which we have seen, will compare favorably with any similar goods in the market, for style, finish and durability. Their illustrated book does credit to the good taste of the company, as well as to the printers. Their works are at Darlington, N. J. Office and salesroom, 69 Duane street, New York.

BRITISH IRON MARKET.

(*Specially reported by cable for The Iron Age.*)

WEDNESDAY, July 22, 1874.

Scotch Pig.—During the week the quotations for makers' Irons have gone up several shillings per ton over the figures last quoted by cable, and the market is now firm at the rise, apparently owing to a genuine shipping demand, the returns for last week showing a slight increase over the corresponding period of last year. Following are makers' prices:

Gartsherrie No. 1	110/
Coltness No. 1	110/
Glengarnock No. 1	93/
Eglinton No. 1	85/

Manufactured Iron.—The market continues quiet. Best Staffordshire Bars are quoted £11 @ £12.

Rails.—The market is quiet, with not much business doing. Welsh may be quoted £7. 10/ @ £8. 5/.

IRON.

American Pig.—Although there is no great demand apparent for Pig Iron, the stocks in the Lehigh are not increasing, according to the best information we can get. There is little or no Gray Forge to be had there, and the stock of other grades is not large. We hear of sales of all grades, amounting to about 2500 tons, at our quotions. We quote: No. 1 Foundry, $31 @ $32·50, at which latter figure some of the companies quote it: No. 2 Foundry, $29 @ $30; Gray Forge, $27 @ $28. Some recent purchasers of Iron at higher than the present prices have refused on technical grounds to receive it from the makers in two cases, from the importers in another. A declining market usually brings about such things; but it should be remembered to the credit of our Iron makers and the importers of Scotch Pig, that in no case, so far as we can learn, when the advance took place, did they shirk from the fulfillment of their contracts.

Scotch Pig.—There is little change in the condition of the market since our last, the sales and the arrivals having both been light. We quote Summerlee, $36 @ $37; Eglinton, $33 @ $34; Coltness, $40. An interesting article from a Glasgow paper on the recent "rig" in that market will be found elsewhere.

Bar.—Since our last quotation the inquiry for Bars has been strong, but the prices offered, however, are ruinously low, 2·8 being the average base offer. No mill in the country can, at present cost of production, lay down in Philadelphia or New York, a good Refined Bar Iron at this price without loss, unless the proportion of extra sizes is very large. Should the demand increase the price will soon advance to at least cover cost. A few mills are already refusing to accept large orders at less than 3 cents in Philadelphia, and we think this price will soon be general.

Rails.—Since our last the Rail market has been without new features, and we quote as last week, $57 to $58, currency, at mill, for American, and $48 @ $50, gold, for Welsh.

Old Rails.—We continue the nominal quotation of $36 for Ts, but they could certainly be bought at cheaper for cash, were there any demand. At present, however, it seems as if more rolling mills were in the market to sell Old Rails than to buy them.

Scrap.—We quote Wrought Scrap $36 @ $38, from store, with very little doing. 400 tons, to arrive, sold at $25, gold

Copper." The manufactures of Copper are steady; we quote New Sheathing 33c.; Bolts and Braziers', 35c.; Bronze and Yellow Metal Sheathing, 24c.; and Yellow Metal Bolts, 30c., net, cash.

Tin.—The business in this article has been duller than at any previous time during the year, the little done being more exclusively of a jobbing nature. We quote: L. and F., 21c. @ 21¼c., gold; English Refined, 21¾c. @ 22c.; Straits, 22¾c. @ 23c.; and Banca, 25½c., all gold. The stock we are carrying is just sufficiently large to help us along during this dull season, while we have afloat but the usual quantity. English quotations per cable, dated to-day, are: Straits and L. and F. at London, £98 (against £98 @ £100 July 11); English Refined, £100. "SINGAPORE, July 21.—Malacca Tin, $35 per picul (against $25·75 July 11)." "PENANG, July 23.—Tin, $24·75 per picul." It was quoted the same thence eleven days ago. From London we have the following per mail, July 11: "The course of the market has been downward both for English and Foreign. Very few sales have transpired, and Straits are quoted nominally, £99 @ £100; Australian, £96 @ £97; and English Blocks and Ingots, £99 @ £100." We may feel assured that Tin will be one of the leading articles speculators will take in hand again in the London market as soon as the present relapse into dullness shall have passed by, being the cheapest metal on the list, when we come to compare its present value with that of a couple of years ago. Our market in Tin Plates has been dull and steady, transactions being limited to a jobbing trade. We quote: I. C. Charcoal, $10·25 @ $10·37½, gold, per box; I. C. Coke, $8 @ $8·25; Coke Terne, $7 @ $7·50; and Charcoal Terne, $9 @ $9·25, all gold.

Lead.—The general characteristic of the market is that of a small jobbing trade in domestic, the sales running up altogether 300 tons for the week at 5¾c., gold, with a few trifling lots that had to be closed out at 5·70; this latter figure may be looked upon as the bottom price. Nothing transpires in foreign, which may be nominally quoted 6⅝c. @ 6½c., gold. The government will be ready to receive tenders between the 10th and 15th proximo, and gradually sell its 9000 to 13,000 tons Lead, which will interfere a great deal more with foreign Lead in this market than with our domestic article. We are now in a fair way to become large Lead producers; we have indeed been expanding more in this direction than in any other raw production in the metal line, and may feel assured that the impulse given to this industry will be checked by nothing. The European accounts, although to us of little practical interest for the moment, are of unusual importance, the demoralization among Spanish Lead miners getting to be greater as the revolution makes headway, or rather as the theatre of war widens. Strikes among miners are the order of the day out there, and they have even murdered one of the principal managers. Should the Carlists get possession of the Southern provinces, where the mines are situated, we may see a sudden, important advance in the London market. The manufactures of Lead are quiescent, Bar at 8¼c., Pipe and Sheet at 9c., with 20 per cent. discount, and Tin-Lined Lead Pipe, 16¼c., less 10 per cent.

Spelter and Zinc.—The former is steady, but excessively dull. Silesian is held with considerable firmness at 6½c. @ 6¾c., gold, according to brands. Domestic we quote all the way from 6¾c. @ 7½c., currency, according to the size of lots offering, within which range it can be currently bought. The German letters are to hand; one of them reads as follows: "HAMBURG, July 9.—Great firmness prevails at Breslau (Silesia), and a couple of thousand centweights 'Silesian Union,' have again changed hands at 6 thalers 25 silbergroschen, which is on a parity with 21·95 marks here, the present asking price." Sheet Zince is moderately active in this market at 8¼c. @ 8½c., gold, foreign and domestic.

Antimony is dull at 11¾c. @ 12c., gold.

COAL.

There has been no improvement in the Coal market since last week. The demand for Anthracite is limited, and trade is exceedingly dull. The prices of all kinds of Coal for August delivery have advanced 15 cents per ton, which is according to the programme announced by the associated companies at the beginning of the year. There is also to be another reduction of 50 per cent. on tonnage in the month of August. The extremely low coastwise freights have enabled dealers to obtain their Coal cheaper this year than they did last year, although the prices of Coal on board vessels averages 15 cents per ton higher than those prevailing this time last year. Consumers, however, are buying very little, as most all of them have already laid in their stocks. The regular monthly sale of Scranton Coal takes place next Wednesday; only 25,000 tons will be offered for sale. Anthracite is selling at $5·25 @ $6·10 per ton, by the cargo. The circular of Mr. Frederick A. Potts, No. 110 Broadway, quotes as follows for August delivery:

SHIPPED FROM PORT JOHNSTON, ELIZABETHPORT HOBOKEN AND TRENTON.

	Lump.	Steamer.	Broken.	Egg.	Stove.	Chestnut.	Washed Pea.
	$	$	$	$	$	$	$
L. & W. C. Co.'s, Wilkesbarre	5 10	5 20	5 30	5 45	5 95	4 90	3 75
L. & W. C. Co.'s, Old Co. Lehigh	6 05	....	6 00	6 00	6 15	5 20	4 00
L. & W. C. Co.'s, Plymouth Red Ash	....	....	5 30	5 45	6 05	4 90	....
L. & W. C. Co.'s, Honeybrook Lehigh	5 90	....	5 85	5 85	6 00	5 05	4 00
L. & W. C. Co.'s, Spring Brook Lehigh	5 90	....	5 85	5 85	6 00	5 05	4 00
L. & W. C. Co.'s, Room Run	5 85	....	5 85	5 85	6 00	4 90	4 00
Fulton Lehigh	6 05	....	6 00	6 00	6 15	5 20	4 00
Scranton	5 10	5 20	5 30	5 45	5 95	4 90	....

The Philadelphia *Ledger* says: "All things considered, the Anthracite Coal trade, in all its branches of production, transportation and consumption, is in a more healthy condition than almost any other great interest, and is certainly sounder than could reasonably be expected in view of the general depression. The net increase of profits of several of the carrying companies is reported something in excess of those of last year to the same time, and, what is of first importance, there is a good understanding between the workmen and the operators. There is a fair movement in Cumberland Coals for steamship purposes and manufacturers' use. Prices, however, rule low."

The market for Bituminous Coal still continues very dull, and prices remain without change. Our quotations are as follows: Cumberland, soft, $6; West Virginia, $7·25 @ $7·50; Pennsylvania and Westmoreland, $7·50 @ $8; American Cannel, $12 @ $14. There is a fair inquiry for Foreign, and prices are nominal. We quote as follows: Liverpool House Cannel, $18 @ $19; Liverpool Gas, $11; Newcastles Gas, $7·50 @ $8; Scotch, $7 @ $9.

The total amount of Anthracite Coal marketed for the week ending July 11, amounted to 261,033 tons, and for the Coal year 9,318,368 tons, against 9,676,558 tons to corresponding time last year, a decrease of 358,100 tons. The Bituminous tonnage for week is 69,806 tons, and for year 1,638,967 tons, against 1,576,947 tons to the same time last year, giving a total of all kinds for the week of 330,839 tons, and for year of 10,957,335 tons, against 11,253,505 tons to the same time last year, a decrease of 298,170 tons.

The Coal transported over the Cumberland Branch Railroad during the week ending July 18, 1874, amounted to 7653 tons, as against 6416 tons shipped in the corresponding period of last year, showing an increase of 1236 tons. Over the Cumberland and Pennsylvania Railroad, for the same period, the shipments were 53,903 tons, against 57.238 tons shipped in 1873, a decrease of 3384 tons.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending July 21, 1874:

Hardware.

Austin, Baldwin & Co.
Guns, cs., 6
Beam & Murray,
Mdse. pkgs., 4
Bodenheim, Meyer & Co.
Packages, 21
Boker Hermann & Co.
Packages, 6
Bawo & Dotter,
Casks, 11
Crane & Co.
Casks, 1
Dickinson Henry,
Packages, 8
Dux W. W.
Cases, 3
Dumont J. S.
Anvils, 150
Degraw, Aymar & Co.
Chains, cks., 7
Frith Edward,
Anvils, 90
Field A. & Co.
Mdse. pkgs., 60
Anvils, 53
Frasse P. A. & Co.
Mdse. pkgs., 2
Fuller Bros.
Mdse. pkgs., 177
Friedmann & Lauterjung
Steelware, cs., 13
Hilger E. & Sons.
Mdse. pkgs., 5
Harmar E. S.
Packages, 3
Hildick A. H.
Mdse. pkgs., 9
Long J. C. & Co.
Casks, 1
Lau & Garlichs.
Mdse. pkgs., 1
Lamarche H.
Nails, bbls., 60
Merchants Dispatch Co.
Guns, cs., 5
Moore Henry,
Wire, cks., 7
Many F. L. & Marshall,
Mdse. pkgs., 3
Wire, cs., 1
Mason John W. & Co.
Wire rope, coils, 23
Noyes, White & Co.
Cases, 2
Patterson Bros.
Packages, 3
Peters Carl,
Cutlery, cs., 6
Plamque de Twaits,
Cases, 12
Schloss Bros.
Steelware, cs., 1
Schoverling & Daly,
Arms, cs., 30
Stratton John F.
Cases, 9
Smith, Cohu & Co.
Chains, cks., 16
Saxton & Seabury,
Bundles, 10
Tome F. & Co.
Cases, 3
Tillotson L. G. & Co.
Galv. wire, lots, 265
Van Wart & McCoy,
Cases, 2
Witte John G. & Bro.
Casks, 7
Wiebusch F.
Cases, 7
Wolfe S. N. & Co.
Cases, 8
Wilson John,
Cases, 17
Ward A.
Mdse. pkgs., 4
Order.
Wire fencing, pkgs., 66
Casks, 7
Cutlery, cs., 4
Wire, bdls., 2127

Iron.

Drexel, Morgan & Co.
Bars, 257
Henderson Bros.
Pig, tons, 400
Laughland & Co.
Haybands, bdls., 750
Wire, cks., 2
Lang W. Bailey & Co.
Rails, 2321
Bundles, 1124
Morton, Bliss & Co.
Rails, 488
Milliken S. Jr.,
Rods, bdls., 392
Naylor & Co.
Rails, 681
Fish plates, bdls., 620
Randolph L. V. F.
Rails, 1918
Seligman J. & W. & Co.
Casks, 173
Williston, Knight & Co.
Boxes, 100
Order.
Band, bdls., 811
Sheet, bdls., 87
Bars, 12,707
Scrap, cs., 625
Beams, 65
Without bills of lading.
Sheet, bdls., 83
Hoop, bdls., 812

Steel.

Brown Wm.
Bundles, 120
Cases, 21
Garvin E. L. & Son,
Bundles, 149
Hogan John,
Packages, 38
Jackson R. D.
Bundles, 226
Naylor & Co.
Mdse. pkgs., 9
Rails, 2648
Bessemer rails, 1141
Cases, 125
Axles, 6
Nicholson G.
Cases, 31
Bundles, 5
Prosser Thos. & Son,
Bars, 323
Forgings, 63
Robbins C. & Son,
Packages, 215
Sanderson Geo. & Co.
Cases, 37
White L. C.
Bundles, 157
Order.
Spring, tons, 57
Rails, 632
Bessemer rods, bdls., 137
Cases, 3
Casks, 3
Bundles, 538

Metals.

Ackerman J. H.
Antimony, cs., 38
Bruce & Cook,
Tin, slabs, 450
Bishop & Co.
Scrap, copper, bxs., 2
Baring Bros. & Co.
Lead, pigs, 1000
Lamarche H.
Zinc, rolled, cs., 5
Naylor & Co.
Tin plates, bxs., 1550
O'Conner P
Brassware, cs., 2
Phelps, Dodge & Co.
Tin plates, bxs., 13,195
Tin, ingots, 1653
Zinc, cks., 285
Shepard Sidney & Co.
Tin plates, bxs., 90
Windmuller L. & Roelker
Zinc, cks., 50
Order.
Bars, 11
Tin, slabs, 639; cs., 5
Lead, pcs, 822; pigs, 3672
Tin plates, bxs., 3334
Spelter, plates, 4120

OLD METALS, PAPER STOCK, &c.

The trade in Old Metals has been very dull during the past week, and the market is overstocked. Prices, however, remain as usual. The market for Rags and Paper Stock is inactive and unimproved, and prices are somewhat weaker, though nominally unchanged. We quote the following as the current purchasing rates:

Old Metals.—Copper, 16c. @ 18c. per lb.; Yellow Metal, 11c.; Brass, 10c. @ 12c.; Composition, heavy, 14c. @ 15c.; Lead, solid, 5½c.; Tea Lead, 4c.; Zinc, 4c. @ 5c.; Pewter, No. 1, 19c.; do. No. 2, 8c. @ 12c.; Spelter, 5c. @ 5½c., Wrought Iron, 1¼c.; Sheet do., ½c.; Cast, do., ¾c. @ 1c.; Machinery, do., 1c.

Rags, &c.—Canvas, Linen, 5c. @ 5½c.; do. Cotton, No. 1, 6c. @ 6¼c.; No. 2, 2½c.; White, No. 1, 6¼c.; No. 2, 4c.; Colored, do., 2c. @ 3c.; Mixed, Woolen, 2c. @ 3c.; Soft, do., 5½c.; Gunny Bagging, 1¾c. @ 1¼c.; Jute Butts, 1¾c. @ 2c.; Kentucky Bagging, 3c. @ 3½c.; Book Stock, 3¼c. Waste Paper and Scraps, 1½c.; Kentucky Bale Rope, 4c. @ 4½c.; Oakum Junk, No. 1, 4½ @ 5c.; do. No. 2, 3¼c.; Tarred Shaking, 1c; Grass Rope, 3c.

PITTSBURGH.

PITTSBURGH, July 20, 1874.

PIG IRON.—Trade continues quiet, as it generally is in midsummer, and notwithstanding there is more or less complaining, there is reason to believe that there is fully as much, if not more, doing than there was at the corresponding time last year. Furthermore, it must not be thought because business has slacked somewhat as compared with what it was a month ago, that the market has weakened, for such is not the case. On the contrary, there is no more, if as much, offering now as there was then, and, from all that your correspondent can learn, there is no good stock offering except at very full rates. Producers, almost without an exception, feel confident in regard to the immediate future. The impression is generally entertained that prices have certainly reached the lowest point, and there is no question but the market is much stronger now than it was a month ago, and while there are still some producers who are willing to contract to a moderate extent at current rates, there are others who have ideas up, believing, as they do, that prices are destined to advance as soon as the fall trade fairly opens up. Many of them expect to be able to obtain $30 for good standard Forge Irons between now and the close of the year, while others have got their ideas up to $32 to $33. Some of the mills have been quietly picking up all the Iron that has offered during the past month or six weeks, and these have a pretty fair supply; but there are others who have, and are still, refusing to buy, and these are almost bare of stock, and it is believed that they will have to pay an advance price when they do buy. Good Mill Irons are from 50 cents to $1 per ton higher now than they were a few weeks ago, and it is intimated that a further advance could be obtained—that is, for future delivery, say, September or October, but, as a rule, furnace companies are unwilling to contract for forward delivery unless an inducement in the shape of much better rates than buyers are willing to give are offered. There are those buyers, however, who can see no inducement in paying an advance for future delivery, as they, at least, affect to believe that Pig will not be worth any more in sixty days than it is now, claiming, as they do, that stocks are very large, and that as soon as there is any indication of an improvement in the market, many of the furnaces that have shut down will at once start up again, and while this may prove to be correct, the outlook at this writing points in a contrary direction.

QUOTATIONS.

No. 1 Foundry	$29·00 @ 30·00—4 mos.
No. 2 Foundry	27·00 @ 28·00—4 mos.
Gray Forge	26·00 @ 27·00—4 mos.
White and Mottled	24·00 @ 25·00—4 mos.
Hot Blast Charcoal	30·00 @ 35·00—4 mos.
Cold Blast Charcoal	45·00 @ 50·00—4 mos.
Blooms, as per quality	70·00 @ 90·00—4 mos.

SALES.—Bituminous Coal Smelted, 40 tons No. 1 Foundry, $30, 4 mos.; 100 do., $29·50; 200 Gray Forge, $27, 5 mos.; 100 Close Gray Forge and Mottled, at $25, 4 mos.; 200 do., Mottled, $25, 5 mos.; 100 Gray Forge (choice), $27·25, 4 mos.; 1000 do., at $27; 750 do., at $27; 100 do., at $27; 100 White and Mottled, $25; Lake Superior Charcoal, 150 tons, No. 2 Foundry, $33, 4 mos.; Hanging Rock Charcoal, 45 tons Mill, at $31 to $32, cash; 39 do., Extra No. 1 Foundry, at $35 to $40, 4 mos.

MANUFACTURED IRON.—The general situation remains substantially as noted in my last report. Some mills have stopped temporarily to take stock and make repairs, but as a rule none of them will remain idle a day longer than is necessary. Some of them report that it is difficult to find time to stop, as they are considerably behind with their orders, and they find it difficult to catch up. Prices, as compared with last week, remain unchanged; that is, makers are still supplying the immediate wants of their regular buyers on a basis of 2·5 to 2·6 for Bars, but they are refusing to contract for future delivery at quoted rates.

NAILS.—The market, while it is quiet is fully up to what it usually is at this particular time, and prices are firm but unchanged, fairly quotable at $3·50, 60 days, with the usual discount of 2 per cent. for cash. Stocks are very meagre, as the factories have been working on orders all season, and manufacturers are sanguine of a good healthy fall trade. Chess, Smyth & Co. have stopped to take stock and make repairs, and others will do likewise within the next week or two, but they will all start up again soon.

STEEL.—The Steel mills continue to have about all they can do. Some report that they are pressed with orders, but it is claimed that prices are low and that the margin for profit is small. The consumption of American Steel, it is almost certain, will be larger during the last than it was in the first half of the year, and manufacturers are hopeful of being able to obtain better prices.

SCRAP IRON.—The market for all kinds of Scrap continues quiet, but there is a firmer feeling, with less disposition on the part of holders to realize, and while prices are without quotable change, an early advance is not improbable.

GAS FOR FUEL.—On Thursday the workmen who have been engaged in boring for gas on the grounds of Moorhead, McClain & Co., of the Soho Furnace, struck a powerful vein, sufficient to run the works, that being the object of the firm in having the wells bored. Graff, Bennett & Co. are also putting down a well at their works, with the same object in view. Rogers & Burchfield have been running their works with gas supplied by one of these wells, and not only is it much cheaper than coal, but it is claimed that it makes a better quality of iron. A large well was struck in Freeport within the past few days, and it is said that the owner of it has proposed to furnish the borough with gas for $500 per annum.

WINDOW GLASS.—Trade is keeping up well, and while it is not as brisk as it was a month ago, it is better than usual at this season of the year. Stocks continue light, and in consequence rates have been better adhered to than usual. Discounts quotable at 60 to 65 per cent. off Pittsburgh list. There is a continued active demand for fruit jars, but the season, as far as manufacturers are concerned, will soon be over. Bottle trade continues dull.

The Pittsburgh *Commercial* of the 18th inst., says: The market for Pig Metal remains about the same as at date of last report, both as to demand and price, with a slight increase in the amount sold. There is a rather firmer feeling, but the price may still be fairly quoted at $27, 4 months, for Gray Forge, and $28 @ $30 for Foundry. A large proportion of the rolling mills are now taking stock, and making repairs. Some that are now out of operation will start up next week and the week after, but others that are now in blast will stop during the latter part of this month and beginning of next, consequently we cannot reasonably expect a much more active demand before the latter part of August. We are reported the following sales:

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.

1,000 tons gray forge	$27·00—4 mos.
750 tons gray forge	27·00—4 mos.
200 tons gray forge	27·00—5 mos.
200 tons mottled	25·00—5 mos.
100 tons close, gray and mottled	25·00—4 mos.
100 tons gray forge	27·25—4 mos.
100 tons gray forge	27·00—4 mos.
100 tons white and mottled	25·00—4 mos.
100 tons No. 1 foundry	29·50—4 mos.
40 tons No. 1 foundry	30·00—4 mos.

HANGING ROCK CHARCOAL.

45 tons mill iron	$31·00 @ 32·00—cash.
39 tons No. 1 foundry, extra	35·00 @ 40·00—4 mos.

LAKE SUPERIOR CHARCOAL.

150 tons No. 2 foundry	$38·00—4 mos.

ANTHRACITE.

10 tons No. 1 foundry	$31·00—4 mos.

CINCINNATI.

Messrs. ADDY, HULL & CO., under date of July 20, write us as follows: The improvement noted in our last still continues. There has been no material advance in price, yet the demand is better, and the prospects for a good fall trade are encouraging.

HOT BLAST CHARCOAL.

Hanging Rock No. 1	₩ ton..$34·00 @ 35·00—4 mos.
" " No. 2	31·00 @ 33·00—4 mos.
" " Forge	29·00 @ 30·00—4 mos.
Tennessee No. 1	32·00 @ 33·00—4 mos.
" Forge	29·00 @ 30·00—4 mos.
Alabama No. 1	32·00 @ 33·00—4 mos.
Missouri No. 1	34·00 @ 35·00—4 mos.
" No. 2	31·00 @ 33·00—4 mos.

HOT BLAST STONE COAL.

Missouri No. 1	₩ ton..$32·00 @ 33·00—4 mos.
" Forge	29·00 @ —4 mos.
Ohio No. 1	30·00 @ 32·00—4 mos.
" Forge	25·00 @ 29·00—4 mos.
Scotch Pig, No. 1	

COLD BLAST CHARCOAL.

Hanging Rock Car Wheel	₩ tn..$50·00 @ 55·00—4 mos.
Missouri " "	48·00 @ 52·00—4 mos.
Kentucky " "	50·00 @ 55·00—4 mos.
Tennessee " "	48·00 @ 52·00—4 mos.
Georgia " "	48·00 @ 52·00—4 mos.
Alabama " "	48·00 @ 52·00—4 mos.
Machinery and Forge	45·00 @ 48·00—4 mos
Blooms	90·00 @ 95 00—4 mos.

LOUISVILLE.

Mr. GEO. H. HULL, under date of July 20, writes us as follows: Prices are steady, but the market is dull, and sales are confined to small lots for immediate use. The usual time, 4 months, is allowed on the quotations below:

HOT BLAST CHARCOAL.

No. 1 F'dry, from Hanging Rock Ores	$33·00 @ 35·00
" 2 " " " "	30·00 @ 32·00
" 1 Forge, " " "	27·00 @ 28·00
" 1 F'dry, from Tennessee Ores	32·00 @ 34·00
" 2 " " "	28·00 @ 30·00
" 1 Forge, " "	26·00 @ 27·00
" 1 F'dry, from Alabama Ores	32·00 @ 34·00
" 1 " " Iron Mountain Ores	34·00 @ 36·00

HOT BLAST STONE COAL.

No. 1 F dry, from Missouri Ores	33·00 @ 34·00
" 2 " " "	28·00 @ 30·00
" 1 Forge, " " "	26·00 @ 27·00

COLD BLAST CHARCOAL.

Car Wheel from Hanging Rock Ores	50·00 @ 54·00
" " Tennessee Ores	48·00 @ 50·00
" " Alabama Ores	50·00 @ 52·00
" " Georgia Ores	50·00 @ 52·00
" " Missouri Ores	48·00 @ 50·00
" " Kentucky	50·00 @ 52·00

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, South Charles and Lombard streets, report us the following prices under date of July 21: This market rules comparatively quiet, with no quotable change in list for the past week, and we report the same improving, though still stagnant.

AMERICAN REFINED BAR IRON.

1 to 6 wide by ⅜ to 1 thick	2·9 to 3·1 cts. per lb.
1 to 4¾ wide by 1¾ to 2 thick	
Round and square, ordinary sizes, from ¾ to 2 inclusive	2 9-10 to 3 1-10c. "
Hoop Iron, 1¾ wide and upward	4¾ to 5c. "
Band Iron, from 1¾ to 4 in. wide	4 to 4¾c. "
Horse Shoe Iron ¾ to 1 wide by ⅜ to ½ thick	4¾ to 5c. "
Norway Nail Rods	7¾ to 8¼c. "
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	16¾c. "
Machinery Steel	11¾c. "
Cast Spring Steel	11c. "
Homogeneous Steel Plate	12c. "
Perkins' Horse Shoes, per keg of 100 lbs	$5·87½
" Mule Shoes " "	6·87½

Common Horse Nails, from 14c. to 18c. per pound.

	10	9	8	7	6	
Putnam Horse Nails	23	24	25	26	28c.	per lb.
	10	9	8	7	6	
Globe Horse Nails	23	24	25	26	28c.	per lb.

R. R. Spikes.....5¾ by 9-16 at 3¾c to 4c. per lb.

CLEVELAND.

Messrs. READ & DICKEY, Iron Brokers, under date of July 20, write us as follows:

PIG IRON.—The market has been quieter the past week than for the one preceding, owing, in part, to suspension by the mills, as also to the unwillingness of buyers to concede the advance asked. Makers, however, are stiffer in their views than otherwise, and are not disposed to make any concessions. Money matters are also growing much easier, while the prospects of a general lucrative fall trade are strengthened weekly. Several large holders of Pig Iron in this region have made no sales for some time, and are not offering except at prices above present market quotations. The demand for Foundry numbers is improving, while the inquiry for Charcoal is much larger than for a long time. Holders of Pig Iron are also strengthened in their views, owing to the reduction of the mining force on Lake Superior and the stoppage of several mines there. All reliable accounts from there point to a very large reduction of the output from figures attained last year. If there should be any material improvement in the price of Pig Iron soon, there will be a scarcity of ore, as furnaces at present running have contracted for the greater part of all that will be mined. Following are quotations:

CHARCOAL PIG IRON FROM L. S. ORE.

Nos. 1 and 2 Foundry	$40·00—4 m.
Nos. 3 and 4 Car Wheel	42·00—4 m.
Nos. 5 and 6	45·00—4 m.
Bessemer Metal, Charcoal	40·00—4 m.
Bessemer Metal, Bituminous	30·00—4 m.

BITUMINOUS PIG IRON FROM L. S. ORE.

No. 1 Foundry	$30·00—4 m.
No. 2 Foundry	28·00—4 m.
No. 1 Gray Forge Red Short	28·00—4 m.
No. 1 Gray Forge Neutral	27·00—4 m.
White and Mottled	26·00—4 m.

PIG IRON FROM BLACK BAND ORES.

Massillon No. 1	$33·00—4 m.
Massillon No. 2	31·00—4 m.
"New Gartsherrie" No. 2	33·00—4 m.
Muck Bar	$41·00 @ 45·00—60 days.

MANUFACTURED IRON.—The market in Manufactured Iron presents, in the main, similar features to that of Pig Iron—that is, if buyers and sellers would agree to split differences, there would be a large amount of business done. The inquiry is very large for Iron at quotations of a week or two since, but as makers have advanced their price fully one-tenth, the amount of orders actually being booked is very small in proportion to those offering. We think the makers, however, are the stronger, and will carry their point, as some are even now obtaining their price, while a large number of mills have orders sufficient to carry them over the next thirty days, and others, being stopped, do not propose again starting unless they can see a chance for profit in so doing. Everything points to Iron reaching even higher figures than those now asked, while the season of higher freights is even at hand, as witness the recent advance in Western rates and in Lake charters, and those who want to buy Iron will do better now than by waiting longer. Sheet Iron, in particular, has advanced more than anything else, and is hard to find for prompt delivery at any price.

NAILS are active and in good demand. The price is improving slowly as the factories get orders booked. We look for a sudden and sharp advance very soon, as Nails are now relatively lower than Bar Iron. We mark up quotations from store here as follows:

	Rates 60 days.
Bar, Band and Hoop Iron	$2·70
Sheet Iron, No. 24	3·60
Nails, 10d. to 60d	3·60
Ship Spikes, ⅜ and larger	4·25

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels.)

PARIS, July 5, 1874.—*Metals.*—On comparing present prices with those ruling a month ago, it will be observed that the European markets have, in some instances, slightly improved, but that the general feeling has not gained in strength. The differences dividing capital and labor have at one time during the month appeared smoothed down, but the feeling of relief has been short lived, and uneasiness on this subject has been revived since, sufficiently so to exercise a depressing influence on the metal markets. *Copper*.—Europe, so far as telegraphic intelligence is concerned, has now been placed within six day's distance from Valparaiso since the Brazilian cable has been successfully laid, and we are thus brought more immediately under the influence of the Chilian charters. These being liberal, the metal has been inactive once more, rather tending downward. Copper prices cannot be kept up, unless the Chilian shipments abate, and metal industry in general be placed on a more satisfactory basis. We have been quiet and steady here at 212·50 francs Chili Bars, deliverable at Havre; common do., 207·50: Ingots, 222·50; Tough Cake, 220; pure Corocoro Ore, 210. Havre has been tolerably well supported as follows: Chili Bars at 205 to 210; Refined Ingots, 215 to 220; pure West Coast Ore, 205 to 207·50; old Yellow Metal, 125 to 135; do. Copper, 185 to 189; Bronze, 160 to 170. Marseilles has been quiet; Chili Ingots, 215; Copper Sheathing, 240; Yellow Metal do., 220; old Copper, 200; old French Yellow Metal, 140; English do., 135, with 3 per cent discount. *Tin*.—After quite a stir during a day or two the metal has relapsed into apathy. We quote here: Banca, deliver ble at Havre or Paris, 272·50; Straits, do., 267·50; English at Havre or Rouen, 256·50. Havre is steady at 270 to 275 Banca, and 260 to 265 Straits. Marseilles is quiet on the basis of 265 francs for Straits. *Lead* is firm, and tending upward; the strike of Lead miners in Spain, and the murder of the manager, made strengthening impression on the European Lead markets, on our own especially so. We quote in this city French Lead, deliverable at this point, 53 francs; Spanish, deliverable at Havre, 53·50; English do., 53; German, here, 53. Spanish at Marseilles commands 54. *Spelter* is slow in its movements, and Silesian, to arrive, is lower. We quote here Silesian, deliverable at Havre, 56 francs; other good brands, 57; deliverable in this city, 57·50. Havre is quiet at 57 to 58. *Iron*.—The improvement and firmness alluded to in our last report continue in the French markets. There is quite a briskening up noticeable at the North, while at the South the quantity of orders being received is most satisfactory. In this city a rise of 5 francs in Coke Pig Iron has taken place. Much more firmness is also reported from the Ardennes. At St. Dizier, Coke Pig Iron is 215 to 220; at the North, 210 to 215. Affinage in the Moselle commands 75. and No. 2 to 3 from 110 to 115 francs. As soon as things shall have begun to improve a general easing up in Iron matters is expected. *Coal*.—There is very little doing at present, the slight briskening of the past fortnight having slackened off. There is quite a movement, however, on the Belgian frontier, mostly in deliveries on forward contracts recently made. As regards the outlook for the ensuing three months, we believe to be safe in predicting that the French Coal market will be quiet and steady. Stock are, on the whole, moderate, particularly at the North and in the Pas de Calais, principally due to the late diminished production and a temporary rush we recently had on the part of some pretty large consumers to lay in a supply; a continued lull in the demand would now soon replenish stocks.

BELGIUM.

(Le Commerce.)

BRUSSELS, July 4, 1874.—*Iron*.—Greater firmness has again been observable on our industrial exchange. There is increased confidence in the future, inspired by a more lively inquiry, but the actual sales and contracts passed are as yet moderate in extent. Business, on a limited scale, has been more exclusively confined to Pig Iron and Sheet. It ought not to be overlooked, however, that our principal competitor, England, is, through stagnation in the Iron trade, now running up stocks, and that while this is the case, it will operate as a check upon any immediate upward movement in our midst. We have exported during the first three months of the year, according to official statements, 20,872 tons of Rails, against 20,182 in 1873; 6647 tons of Sheet Iron against 4045; 21,100 tons Wrought Iron, against 21,414; the grand total of Iron export being 61,053 tons, against 58,549 in 1873. The decrease in the import movement has been 29,670 tons Ore, and 16,300 Pig Iron. *Coal*.—Although some of our industrial papers insist upon increased animation as being noticeable, we fail to perceive it. Prices are, nevertheless, being fully sustained for moderate quantities, while large bargains are being made below the current range of values. We have imported less coal during the first three months, 28,000 tons, against 41,000 in March, 1873, making altogether for the quarter 89,000 tons, against 105,000 tons. From Germany we got 19,000 tons less, and from England 17,000 in excess. We exported during the quarter 698,600 tons, against 1,027,000 in 1873.

GERMANY.

(Borsenhalle.)

HAMBURG, July 6, 1874.—With the sole exception of Lead, which has been stirred up by political and industrial events in Spain, the metal markets of Germany have, on the whole, been apathetic and barely upheld at recently established rates. *Copper*.—Our three leading markets have been quiet at the following prices. Hamburg, Chili Refined, 89 to 100 marks; Demidoff, Russian, 100; Norwegian, 89 to 100; English refined, 88; Stettin, Swedish, 29 to 32 thalers; and Berlin, ditto, 27⅛ to 28; English, 27⅛ to 28, and Chili refined, 27⅛ to 28. *Tin* has become weaker as the week proceeded, and we quote the same here: Banca, 1·12 marks; English, 1·10; and M. R., 1·12. *Lead* has been steadily looking up, and we now quote English Pig 24½ marks, and German 25 to 25¼. At Berlin great firmness prevails, Tarnowitz at 7¾ to 7⅞ thalers, Freiberg, 7¾ to 7⅞, and Clausthal at 7¾ to 7⅞. Steadiness is also observable at Stettin at the recent improvement, Spanish being quoted there 8¾ to 9 thalers, and German 8¾ to 9.

HOLLAND.

(Koch & Vierboom.)

ROTTERDAM, July 7, 1874.—*Tin* has been moving in a dull mood. Banca, spot, has been done at 59¾ to 58¼, from the July sale; futures at 59 to 58, and September auction do. all the way down to 57 guilders.

BANCA.

	1874. Slabs.	1873. Slabs.
June deliveries	13,379	11,467
Six months' deliveries	68,623	72,119
Stock on warrants July 1	14 529	37,496
Unsold stock July 1	126,363	113,213
Afloat	Piculs 7,300	15,900

BILLITON.

June deliveries	....	..
Six months deliveries	2,967	1,831
Stock on warrants	200	100
Unsold stock	....	....
Stock in private hands	33,450	12,653

CHINA.

(Arnhold, Karberg & Co.)

CANTON, June 5, 1874.—*Metals.*—*Lead* has again experienced a very dragging market throughout, and prices show a further decline of 10c. to 15c. per picul. *Tin.*—The recent buoyancy has given place to depression, with a decline in prices, buyers having failed to respond to the increased pretensions of sellers. *Quicksilver.*—The inquiry for this article has been active, and has resulted in a considerable business at gradually hardening prices, culminating in an advance of $10 per picul. The small stocks now here are held for still higher prices. We quote: Lead, $6·75 to $7·15 per picul; Tin, $25·50 to $27·75, and California Quicksilver, $190 to $191; English, $188 to $189. Exchange, 6 months', London, 6/1¼.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, Eng., July 6, 1874.

GENERAL REMARKS.

Methaphorically speaking we appear to be striving to outvie the superlative excellence displayed by Artemus Ward's corps of officers in "resting muskits." We are literally at a dead stand still in all iron trade matters, always, of course, excepting the little diversities of opinion between capital and labor, and an occasional inroad of foreign competitors. In the former of the two last named variations, South Wales has again appeared on the scene, as briefly alluded to in my last letter, and is likely to carry off foremost honors for a strike of great magnitude. Details will be found under the proper heading lower down. The "foreigners" are now, at least, having some little revenge for the many clear defeats they have sustained in commercial matters at our hands, and have again, during the past week, carried off several British orders. In this respect, also, details are appended. The Scotch market has been chiefly remarkable for a considerable collapse in prices—say 80/ per ton in warrants—brought about by the triumph of the "bulls," who are reported to be in possession of the whole stock of warrants. This, however, I scarcely believe, seeing that a respectable Glasgow circular of Friday night intimates that the drop is entirely owing to the failure of a desperate speculative venture, and thinks that the lower prices may do something to resuscitate trade. At Sheffield, business rules quiet, and at Birmingham matters are almost stationary pending the result of the quarterly meetings, later this week. Some of the South Wales works are a little better employed, but the total output of the district continues very restricted indeed.

THE SCOTCH PIG IRON MARKET.

Writing on June 30th, Messrs. Wm. Colvin & Co. remark: "The warrant market, which closed on Tuesday last at 100/, continued at about the same price up till Friday afternoon, when a sudden fall took place to 80/, for cash, on Monday. This week very little business has been done from 80/6 to 77/6, closing this afternoon at the lower price. We quote No. 1 G. M. B., 82/6; No. 3, 80/."

Messrs. James Watson & Co.'s Glasgow circular of July 3d runs as follows:

"The destructive speculative venture in Pig Iron engaged in by an outside clique of operators, assisted by one or two members of our trade, suddenly collapsed on the 25th and 26th ultimo, when the price of warrants dropped from 105/ to 80/, and has since ranged from 74/ to 77/6, cash, closing nominally this afternoon at 77/6. It now remains to be seen whether this reaction is sufficient to resuscitate trade, and bring back orders from those markets which have been shut against us. Shipments last week were 6415 tons, against 12,107 tons in the corresponding week of 1873; total decrease for this year is now 133,767 tons. We quote:

	No. 1.	No. 3.
G. M. B., at Glasgow	80/	77/6
Gartsherrie, "	102/6	83/
Coltness, "	103/6	....
Summerlee, "	96/	81/
Langloan, "	101/	83/
Carnbroe, "	85/	81/
Calder, at Port Dundas	101/	83/
Gleugarnock, at Ardrossan	91/	82/
Eglinton, "	82/	80/
Dalmellington, "	80/	77/6
Shotts, at Leith	96/	86/
Kinneil, at Bo'ness	86/	77/6

Up to time of posting, Messrs. Swan's circular had not reached me.

The make of iron is still considerably in excess of the demand, and stocks in Connal's stores are still on the increase. For the first time this year last week's returns show a decrease of 400 tons in the quantity of pig iron imported into Grangemouth from the Cleveland district. When Scotch pigs reach a somewhat lower figure, it may reasonably be presumed that the importations of Cleveland pig will wholly cease. That such will presently be the case may be inferred from the current augmentation of stocks and the very gentle demand. Already the malleable iron trade manifests better symptoms, but there can at present be little real activity. Both it and the ship building trade will be greatly benefited by a further fall in raw materials.

CLEVELAND AND BARROW-IN-FURNESS.

Many of the blast furnaces in Cleveland are being got to work again, now that the supply of ore is equivalent to the wants of the furnaces. Whether trade will revive sufficiently to induce rail and finished iron producers to order pig freely is still a very open question. If not, most of the furnaces will be better out of blast, except in the cases of such firms as do an export trade or are able to work up their own material. The local rail makers—all iron—complain very much of the continued lapse of orders, but speak with some little hope of a few months henceforward, basing their confidence on vague rumors from Russia of a "good time coming." In the Barrow district there is a moderate amount doing at one or two establishments, although many of the furnaces are idle. The Barrow Steel Works are still doing a good stroke of business in rails for Canada.

THE SHEFFIELD TRADES.

In some instances work is at present suspended for stocktaking, a weighty undertaking at the large establishments, and one which takes up two or three weeks. Australia is just now one of our very best customers for almost all kinds of edge tools and general machine, &c., tools. Some houses, as a matter of fact, make a special class of goods for this market, one in particular being a long kind of billhook with a special handle, made to resist the destructive thorns and spikes of the acacia and other undergrowth, which cumbers the ground and must needs be removed. I also hear of an exceedingly large indent from this colony for every possible description of surgical instruments that can be made, from simple trusses upward in the scale of these useful aids to frail or wounded humanity.

It is believed that the shipping of Spanish ore from Bilbao will be resumed within a few weeks, in which case a real relief will be afforded to the two or three great local companies using them. In the meantime Cumberland ores remain steady at 25/ to 28/ per ton at the mines, but hematite pigs are easier, probably owing to the restricted demand for Bessemer material and rails. Bessemer hematite pigs cost about £6 to £6. 2/6 here for No. 1, and £5. 17/6 No. 3. Ordinary hematite pig is quoted at the works, No. 3, £5. 10/; No. 4, £5. 10/; No. 5, £7. 10/; and M, £7. 5/ per ton. Notwithstanding the extraordinary statements which are circulated as to the continued great demand for Bessemer material, I must again state that there is but an indifferent inquiry for it, and that to my own knowledge one of the largest Bessemer houses in the district is almost at a standstill.

This must necessarily be the case when specifications for rails are so few in number and of such light calibre, and when axles and tires of this material can be produced £1 to £1. 10/ per ton cheaper in Belgium and Germany than our own quotations. Some few firms have exceptional advantages which enable them to dispense with imported spiegeleisen, and so effect a considerable saving, which is further augmented as much as possible by cogging down or rolling down ingots, instead of resorting to the more expensive mode of hammering in vogue in former and less critical times. By adopting these resources they save some labor and material, and so are enabled to compete on a better footing than they otherwise would in the Continental markets.

One or two firms are turning out moderately good lots of railway springs for the use of wagon builders, railways (Indian, colonial, and home), and miscellaneous purposes. There is also a fair inquiry for wheels in pairs or sets of four for Austria, Italy and Northern Europe.

On Monday a delegate meeting, representing some 25,000 South Yorkshire and North Derbyshire miners, was held at Barnsley, in order further to consider the owners' notice of a reduction of 12½ per cent. on the gross earnings. Letters were read from Mr. Burt, M. P., Mr. Thos. Halliday and others, showing that the state of trade in all the mining districts was not such as would warrant the men resorting to a strike. A discussion of two hours resulted in the confirmation of the previously arrived at decision to accept a drop of 10 per cent. only from the 57½ per cent. advances given since October, 1871. This is just half of what the owners require.

In consequence of this iterated determination to resist, the colliery proprietors of the above districts held a special meeting at Barnsley on Tuesday under the presidency of Mr. Stewart. A fair and full discussion was gone into, at the termination of which it was determined to adhere to the former resolution to enforce a reduction of 12½ per cent. on gross wages. Both sides appear quite resolute, hence there is every reason for supposing that on July 8th about 21,000 men will be out, representing a diminished output of about 8,000,000 tons per annum.

At a meeting of the creditors of Samuel Osborne & Co., Sheffield, on Friday the agreement between Mr. Osborne and the trustee, whereby the former undertakes to pay the creditors 12/ in the pound, was ratified, and an order of discharge was unanimously granted to Mr. Osborne. This brings the public proceedings to a close, and I suppose the business will go on as usual. There is no movement in cutlery to report, the business doing being merely routine, and on the smallest possible scale, "just to keep things going."

THE EIGHTY TON GUN.

I take the following paragraph from *The Times:*

"The manufacture of the 80-ton gun at the Royal Gun Factories, Royal Arsenal, Woolwich, excites considerable interest in the department, the gun being more than twice the size of any one at present in existence. The steel block from which the inner tube or lining is to be made arrived at the Royal Arsenal, Woolwich, on Tuesday, by rail, from Messrs. Thomas Firth & Sons, at Sheffield, and is believed to be the largest piece of steel ever produced. It is 25 feet in length and 25 inches in diameter at the thickest end, but is tapered off toward the muzzle, where the strain of the explosion becomes less. It weighs about 16½ tons in finished forged size. It will be taken into the turnery, where a couple of large lathes will be employed to smooth its outer surface, after which it will be bored out in the boring mills. The cascabel arrived at Woolwich from the same firm on Saturday last, and the trunnion piece, which weighs 18 tons, has been manufactured in the Royal Gun Factories at Woolwich. This is the largest forging ever produced in the Royal Arsenal. The Infant School, as the fine array of large guns displayed on the occasion of the recent visit of the Emperor of Russia has been called, is now being broken up, as some of the guns are required for service on board the iron clad ships, to which they are about to be conveyed."

BIRMINGHAM AND SOUTH STAFFORDSHIRE.

The trades of Birmingham and district continue to be characterized by much dullness—particularly in such branches of hardware as need iron in their production. There are but few Continental or general foreign orders, mainly owing to the fact that merchants are everywhere entertaining the belief that prices will shortly fall. In one or two departments colonial specifications are much above the average, and in others they are just sufficient to compensate for the lightness of other indents. There are a few good Russian orders for tools and machinery, and Sweden, Norway and Denmark are each taking fairly large lots of cheap hardwares, box irons and screws and general hardware goods. The home trade in these goods is still remarkably quiet. The metal rolling, brass and cased tube branches are doing well, mostly in thin sheets for cartridge purposes for the foreign orders now in course of execution, for cabinet and certain kinds of builders, brass foundry and the bedstead trade. Very little is doing in either brass, iron or copper wire. The safe makers are fully employed on old orders, and galvanizers are able to report an improved South American demand. The tin plate workers are growing very short of employment, and there is hardly so good an inquiry for edge tools. The firm which has up to now been known as Nettlefold & Chamberlain, of Birmingham, Smethwick, Kings Norton and Wadley, manufacturers of wood screws, bolts, nuts, rivets, ironwork and wire, has been dissolved, and the business will now be carried on by Messrs. Edward John, John Henry and Frederick Nettlefold, under the title and style of "Nettlefolds." The new firm has inaugurated business by a reduction of prices in wood screws, and iron, brass and copper screws. Following is an abstract of their circular on the subject:

"Iron screws increased from 40 to 50 per cent. in discount; brass screws from 60 to 62½ per cent.; and copper from 35 to 40 per cent. At the same time, they advise advances on the following, discounts being reduced from 5 to 10 per cent.: Chis 1 pointed nails, 5 per cent.; sash and table screws, billiard bolts, American sleigh, tire and stove bolts and nuts, 10 per cent.; coopers' and tinmens' rivets, hitch pins, bridge pins, 5 per cent. An alteration also takes place in the list price of bright head carriage bolts and nuts, subject now to a larger discount, altering the prices in the following proportions: ¼ inch and 5-16 inch remain about the same; in the ⅜ inch, a reduction of about 5 per cent. up to 3 inch; 4 inch remaining the same, and the 5 and 6 inch *advanced* about 5 per cent. The 7-16 are generally advanced from about 10 per cent. on the 3 inch to 7½ per cent. on the 6 inch; on the ½ inch all sizes are advanced from 10 to 15 per cent. These are net reductions. The reductions in addition to those already named are: Dowel screws, 10 per cent.; cone-head screws, mushroom-head bolts and nuts, galvanized, 5 per cent.; raised head-screws, cheese head screws, 10 per cent.; chair screws and nuts, patent forged nuts, 5 per cent.; bright hexagon nuts, 10 per cent.; railway cotters, 5 per cent.; gill rivets, 5 per cent.; these reductions being an increase of discounts of the amounts stated, making a net reduction of from 10 to 20 per cent. according to the high or low rate of discounts. All other goods of their own manufacture, including range screws, remain unaltered.

In alluding to American competition in plated goods the Birmingham *Post* says:

"Touching the competition in this branch by foreign (American) made so called 'plated goods,' we have been shown some American goods produced in Birmingham, style, quality &c., exactly as advertised by houses who are making a point of these productions; and as they can be got up in Birmingham at less cost than abroad, and do not at the price tempt a trade, there is evidently not much to fear from our Transatlantic cousins. The laudable desire of the Board of Inland Revenue to decide what is gold and what is not may, perhaps, lead to good results, but at present the South Wales magistrates very properly object to call low alloys gold, and if this should be the first step toward an approximation of the English to the French practice, the trade will hail the change with satisfaction, as giving the public a guarantee of quality, and protecting producers and consumers alike."

I am again unable to give your readers much information as to the Staffordshire iron trade. Quotations are very steady, and in the cases of tube strip, hoops and certain grades of sheets, signs of firmness are apparent. Messrs. Millington & Co. have put down their marked bars to £12, which is the basis of all the leading houses except Earl Dudley (£14. 12/6), Messrs. Barrows and John Bagnall & Sons (£14), Messrs. Bradley & Co. and the Darlaston Steel & Iron Company (£13). Plenty of unmarked iron is to be had at from £10 to £11. In no instance is much business being done, the general expectation being that, by the settlement of the Cannock Chase miners' strike (by which 6000 men are put in a position to resume work this week), the Staffordshire miners will also be induced to give in at once. In either case, but particularly in the latter contingency, a very great quantity of coal will be thrown into the market, which must necessarily lower its price—a reduction which cannot fail to be felt by the iron trade—the inference being that the quarterly meetings will result in a drop of £1 per ton.

THE BELGIAN COMPETITION.

A Bristol paper says that the Bristol & Exeter Railway Company has accepted the tender of a Belgian house for 200 sets of tyres, the price being much below that of English makers, and a Birmingham correspondent thus discourses on the same theme: "Belgian ironmasters are in this district personally conferring with customers, and seeking to do business direct, without the intervention of merchants. I have examined a lot of iron just delivered; it consists of three-quarter rounds, small squares, and flat bars; and I have no hesitation in declaring it to be excellent iron. The round would bear great tensile strain; but a nick would quickly lead to a fracture. A fracture, when made with a chisel, reveals iron which possesses more the appearance of charcoal iron than any thing else. The crystals are small and uniform, and of a good hue. Reduced to a smaller size, the rounds would, I have no doubt, throw up an excellent fibre. Small squares, which were in all probability made from the same piles, were beaten out upon the anvil to a point equal to that of any horse nail, and the flat bars could only be fractured after being brought end to end by a vigorous application of the sledge hammer. The fracture revealed a tough and clean fibre. The iron is the No. 2 of one of the leading mill and forge firms of Belgium, and even at the subsisting reduced rate of prices of the iron made here, with which it chiefly competes, it gives an advantage in its favor, in the London market, of 30/ per ton. About as good a quality can be obtained by any good buyer who knows South Staffordshire well at ten guineas per ton. To take the Staffordshire iron to London would cost 15/, thus making it in the London warehouse or at docks £11. 5/. The Belgian iron can be obtained in London at £9. 15/. Much of the iron sent out by the merchants in the Midlands to European or antipodean ports is shipped from London. The buying of Belgian iron would enable them either to supply customers at 30/ less than for Staffordshire iron, or put that sum, per ton, in their own pockets. A merchant of my acquaintance, who does a large foreign trade, and who has a fair supply of Belgian iron in his warehouse, is now slightly hesitating as to the giving of a good order for general merchant iron in which three-quarter rounds are included. His only difficulty is the want of complete fibre in the rounds of that size made into bolts, although the requisite manipulation would take away some of the crystal, yet the iron would not prove so tough as could be desired. For certain purposes, as will occur to your readers—such, for instance, as chain making—the iron would be excellent. If the merchant I have referred to could only be sure that the Belgians would meet his requirements in this particular article, they would quickly get his order. The probability is that what the merchant desires will be brought about. The fact of the presence of the Belgian ironmasters, to which I referred in opening, testifies to the desire they have of meeting the views of Englishmen. This Belgian competition has also an important bearing upon the trade with the United States and Canada. British merchants who do a large business with the New World, *via* Liverpool, may now order from Belgium iron in every respect equal to the general run of reliable brands in this district, and have it shipped to customers direct from Antwerp. Belgian makers will put on board in that part at £9. 4/ per ton merchant iron in no way inferior to that for which £10. 10/ has to be given in South Staffordshire, and which by the time it gets to Liverpool is only a few shillings less costly than the same quality shipped from London. Thus, Belgian iron shipped at Antwerp is nearly 40/ a ton cheaper than iron of a corresponding quality of British make shipped from Liverpool. Consequently Belgian iron, as good as South Staffordshire iron, can be obtained in New York at pretty much the price of Staffordshire iron at the works. That consumers in the United States have found out the means of getting finished iron from Belgium at much lower prices than those at which they can purchase South Staffordshire iron delivered I have reason to know; and it is not a little significant of that fact, that the Belgian iron that is coming to this country, and certain of which I have examined and tested, is branded 'Best Refined,' a brand in great favor in the United States."

THE SOUTH WALES DISTRICT.

From this district the news is not of a very encouraging nature. In all directions mills are being closed and furnaces blown out. The whole of the Welsh ironmasters met in London last week and passed a resolution to terminate all contracts at once. This was accordingly done, notices being affixed at all the leading iron works in Monmouthshire and South Wales terminating all contracts at the end of the month. The following day the iron and coalmasters met at Cardiff and arrived at the determination to put down wages at once. It is supposed that the drop will be 30 per cent., in addition to the 10 per cent. recently taken off. Whatever the result, the Welsh ironmasters are manifesting a plucky firmness, which is to be admired, standing as it does in bold contrast to the weakness and vacillation of the masters in certain other districts. The Welshmen evidently believe in taking the bull by the horns. Very little is doing even in rails, which are now down as low as £7. 10/, at which figure there is a dead loss of 10/ to £1 upon every ton made, particularly where the materials have to be bought at current rates in the open market.

THE METAL MARKETS.

Metals, generally speaking, have been quiet, and no great sales are reported. Prices, in the main, have been maintained. *Iron* says: "In copper, the charters for Chili for the last half of May were 2700 tons, of which 900 tons were bars, and 1800 ore and regulus. 300 tons of ore sold at Liverpool at 15/6, and 400 tons Regulus at Swansea at 15/9. The market here has been dull, prices tending downward. The sales reported here were 75 tons Chili bars g.o.b., at £79. 5/, cash. Friday, 100 tons Chili bars g.o.b., at £79. 10/, with three months, and 50 tons at £79, with one month. Saturday there were no sales. Monday, 25 tons Chili bars g.o.b. sold at £78. 15/, and 100 tons at £78, both cash. Tuesday there were no sales. Wednesday, 25 tons Chili bars g.o.b. sold at £78. 5/, and 75 tons at £78. 10/, cash. Tin has been very quiet, with receding prices. 50 tons Straits sold here at from £100 to £101, and 20 tons Australian at from £98 to £99. Closing, £98. Lead has been firm, prices tending upward. Good soft English pig, £21. 5/ to £21. 10/. Soft Spanish, without silver, £20. 10/ to £20. 15. *Zinc*—150 tons London rolled sold here at £25. 17/6. Spelter has moved off slowly at from £21. 15/ to £22 for common Silesian, and £22 to £22. 10/ for best do. Quicksilver continues very scarce at £19. 15/ per bottle."

Messrs. Pitcairn, Campbell & Co.'s report (June 30th) has the following:

"After the issue of our last report there was a rapid advance in the value of Chili bars to £80 per ton; but the upward tendency was checked on the 25th by the receipt of cablegram advising charters for second fortnight in May as 900 tons bars, 1800 tons in regulus—in all, 2700 tons fine. We close quietly with quotations of £78. 10/ to £82 for Chili bars, 15/3 to 15/9 for good ore and regulus, and 16/9 to 17/ for Corocoro barilla. Business transacted during the fortnight comprises on the spot here (Liverpool) about 3300 tons bars at £77 to £80 per ton, and 450 tons ore at 15/3 to 15/6 per unit. To arrive or with extra prompt, 785 tons bars at £79 to £80. 10/ per ton. At Swansea, 1200 tons ore at 15/ to 15/3, 540 tons regulus at 15/9, and to arrive there 670 tons ore at 15/3 per unit. Stocks of copper (Chilian and Bolivian) in first and second hands, likely to be available, we estimate at—Liverpool, ores, 1559 tons; regulus, 1278 tons; bars, 13,000. Swansea, ores, 2693 tons; regulus, 3829 tons; bars, 1315, representing about 17,500 tons fine copper, against 22,900 do. June 30th, 1873; against 13,800 do. June 30th, 1872; against 21,590 do. June 30th, 1871."

Messrs. Sanford & Bird's price current, July 1st:

"*Tin*—There has been very little business doing in this metal during the past month, and prices remain nominal. The arrivals of Australian tin ore have been about 460 tons, and we estimate the stock in London to be equal to about 650 tons of pure metal. *Tin Plates*—The associated masters have reopened their works to the men for a month at the old rate of wages, but it is quite uncertain whether the workmen will resume on these conditions. If they do not, the present situation will be prolonged for probably some weeks longer. Meanwhile, any demand that might arise is checked, and buyers will only place orders for immediate execution."

Messrs. Richardson & Co. (July 1st) remark: "Averages of Cape copper produce sold for the quarter ending June 30th, 1874: Produce, 32½ per cent.; price for 21 cwt., £24. 12/7; price per unit, 15/3; standard calculated for nine per cent. produce, £97. 13/6. The stocks of foreign copper produce remaining unsold this day are: Chilian, 2513 tons copper ore, 4132 tons regulus, 1379 tons copper; Cape, 680 tons copper ore, 130 tons regulus; Portugese, 216 tons copper ore; British, 670 tons copper ore. These totals represent about 4330 tons fine copper. The private sales effected during the month realized 15/ to 15/9 per unit. We have had two public sales, fetching the following prices: On the 9th, 1341 tons, wholesale 14/11 per unit for an average produce of 19⅝ per cent., Cape 15/5 per unit for an average produce of 33⅛ per cent.; on the 23d, 1008 tons wholesale 15/0½ per unit for an average produce of 16 5-16 per cent., Cape 15/7½ per unit for an average produce of 33¾ per cent. We are able to report a sounder condition in the copper market; during the past month there has been a very fair average of transactions at improved rates. The Chili charters advised since our last issue are as follows: For the first half of May 1600 tons—990 in bars and ingots, 600 in ores and regulus, and 100 bars for France; for the second half of May 2700 tons—990 in bars and ingots, and 1800 in ores and regulus. This latter is rather heavy, but it has had no very damaging effect upon the market—Chili bars suffered a little just on receipt of the news. This article has been very steady throughout the whole month, g. o. b. ranging from £77 to £80. Furnace material has continued its upward course, and to-day, notwithstanding the close of the half year, which always tends to inactivity, we can quote 6d. the unit in advance of our values on the 1st ultimo, and we hope the increasing ease in our money market will materially assist in furthering this improvement. We quote ores and regulus 15/6 to 16/ per unit; tough cake, £85 to £88; Chili bars, £79 to £81. Bar silver, 4/11 per oz. standard. *Tin.*—English block, £101 to £103; Straits, £101 to £102; banca, £104 to £106. *Lead.*—English pig, £21 to £21. 5/. *Spelter.*—£23 per ton. Bank rate of discount 2½ per cent.

Lake Superior Ore Shipment.

The Marquette *Mining Journal* says:

An erroneous inference may, perhaps, be drawn in regard to the total product of ore this year, from the amount of shipments given to this date, unless certain elements of comparisons are clearly understood. Several circumstances have conspired to increase the shipments of May and June this year far beyond the proportion which they bore to the whole shipments last year. Among them are the following:

1st. The opening of navigation was about a fortnight earlier this year than last.

2d. The rates of lake freight this year have thus far been much lower than those of last, so that all the charters made for ore transportation have been kept in the trade, and worked to their fullest extent in all cases where there was any option on the part of the vessels; whereas, last year, when grain freights were higher than ore freights, no ore was carried by season chartered vessels in the early part of the season which their contracts would enable them to avoid.

3d. The contracts for the lake transportation of ore, which were generally and largely made last summer by the ore companies, to run through the present year, and which must be filled as the vessels come round, have occasioned the working of some of the mines thus far, which would otherwise stop work in the present depressed condition of the iron market. In the course of six weeks more these charters can be exchanged by the ore companies for grain freights without loss, and, perhaps, at a profit. They will not then be as they are now, compelled to ship any stated quantity, and the shipments of the latter part of the season will diminish greatly compared to those of last.

4th. Railroad facilities for shipment from several large mines, such as the Republic, Kloman, Spurr and Michigamme, were not complete till near the middle of June last year; while this year those mines, under the effect of the circumstances which have just been mentioned, had shipped nearly or quite 50,000 tons of ore by that date.

The total ore product of all the mines of the Lake Superior district for the whole season of 1874 is pretty certain to be 40 per cent. less than that of 1873. This estimate is based on the fact that all the producing companies have curtailed operations fully to that extent, and during the winter months some of the companies suspended operations entirely, while others reduced production to even a larger per cent. than that mentioned.

The Western Union Telegraph will put up in their new building in Broadway the first water balance elevator ever permanently used in New York. This elevator was patented a few years ago by Mr. Baldwin, a New England inventor. After undergoing considerable modifications it has been extensively adopted in Chicago and other Western cities. Its motive power is the attraction of gravity, which is applied by means of an iron bucket 12 feet long, fitted like a piston into an iron tube 2½ feet in diameter, which extends along one side of the elevator shaft from top to bottom. This bucket is equal in weight to the elevator, with which it is connected by wire ropes running over pulleys. To carry a load up it is only necessary to fill the bucket with water from a reservoir at the top of the building, which can be done by the conductor by pressing a pedal in the car connected by wires with the reservoir. The weight of the water causes the bucket to descend and the car is thereby drawn upward. Stoppages are made by means of a break, which clamps the rail upon which the car runs. In order to descend the water is let out by the pressing of another pedal connected with a valve in the bottom of the bucket. To regulate the speed of the car there is a tube passing through the bucket provided with a valve at each end. As the bucket fits air tight in the large tube it can only rise or descend at a rate of speed proportioned to the rapidity with which the air can pass through the smaller tube so as to get out of its way in front and fill the vacuum created behind it. This is regulated by the valves. The points claimed in favor of the new elevator are smoothness and rapidity of motion. It is provided with safety breaks closely resembling the breaks used in the Wilcox & Gibbs sewing machine. The water has to be pumped into the reservoir by steam-power.

London Metal Market.

(From The Mining Journal.)

		£.	s.	d.	£.	s.	d.
Copper—₱ ton.							
Best Selected		85	0	0	88	0	0
Tough Cake & Tile		85	0	0	87	0	0
Sheathing and Sheets		83	0	0	84	0	0
Bolts		86	0	0	88	0	0
Bottoms		93	0	0	95	0	0
Old		80	0	0	85	0	0
Australian		88	0	0	90	0	0
Wire	₱ lb.	0	1	0⅛		—	
Tubes	"	0	1	0⅛	0	1	1
Brass—₱ lb.							
Sheets		0	0	10	0	0	11
Wire		0	0	10¼	0	0	11
Tubes		0	0	11	0	0	12
Yellow Metal Sheathing		0	0	8	0	0	8¼
Sheets		0	0	8		—	
Spelter—₱ ton.							
Foreign on the spot		22	5	0		—	
" to arrive		22	0	0		—	
Zinc—₱ ton.							
In Sheets		28	0	0		—	
Quicksilver—₱ bottle		19	15	0		—	
Tin—₱ ton.							
English Blocks		104	0	0			
Ditto Bars (in bris.)		105	0	0		—	
Ditto Refined		106	0	0		—	
Banca		104	0	0	105	0	0
Straits		101	0	0	102	0	0
Australian		97	0	0	98	0	0
Tin Plates—₱ box.							
IC Charcoal	1 qual.	1	16	0		nom.	
IX "	1 qual.	2	0	0		"	
IC "	2 qual.	1	15	0		"	
IX "	2 qual.	2	1	0		"	
IC Coke		1	9	0	1	12	0
IX "		1	15	0	1	16	0
Canada Plates	₱ ton.	19	0	0		—	
"	at works	18	10	0		—	
Iron—₱ ton.							
Bars Welsh, in London		10	0	0		—	
"	to arrive	9	15	0		—	
Nail Rods		11	0	0		—	
Nail Rods, Staff'd in L'ndon		11	5	0	11	10	0
Bars		11	10	0	14	0	0
Hoops		12	10	0	14	0	0
Bars at Works		10	10	0	11	10	0
Hoops ditto		11	10	0	14	10	0
Sheets, single, and plates		13	10	0	15	0	0
Pig, No. 1, in Wales		5	0	0	6	10	0
Refined metal ditto		7	0	0	8	0	0
Bars, common ditto		9	0	0	9	5	0
Do, merchant, Tyne or Tees		9	0	0		—	
Ditto, Railway, in Wales		7	15	0	8	0	0
Ditto, Swedish, in London		18	0	0		—	
To arrive		16	0	0	17	0	0
Pig, No. 1, in Clyde		5	0	0	6	0	0
Ditto, f.o.b., Tyne or Tees		4	0	0	5	0	0
Ditto, Nos. 3, 4, f.o.b.						—	
Railway Chairs		5	0	0	5	5	0
" Spikes		12	10	0	14	0	0
Indian Ch'coa. Pigs in L'don		10	0	0	12	0	0
Steel—₱ ton.							
Swedish, in kegs (rolled)						—	
Ditto (hammered)		21	10	0	21	10	0
Ditto, in faggots		21	15	0		—	
English, spring		18	0	0	25	0	0
Lead—₱ ton.							
English Pig, common		21	0	0	21	5	0
Ditto, LB		21	5	0		nom.	
Ditto, WB		23	0	0		—	
Ditto, Sheet		23	15	0		—	
Ditto, Red Lead		25	0	0		—	
Ditto, White		30	0	0	32	0	0
Ditto, Patent Shot		25	0	0	25	10	0
Spanish		20	10	0	20	15	0

* At the works 5s. to 6s. 6d. per ton less. † One plates 2s. per box below the rates of similar brand.
‡ Add 6s. for each X.

Trial of a Welding Compound at the Navy Yard.

During the past week Mr. Herman Schierloh, of No. 24 Exchange Place, Jersey City, has been conducting a series of experiments at the Brooklyn Navy Yard with the cherry heat welding compound described in a recent issue of this journal. Some of the tests we had the pleasure of seeing, and the results were very satisfactory. The commission appointed to witness the experiments have submitted the following report to Vice-Admiral Rowan:

NAVY YARD, NEW YORK, July 22, 1874.

SIR: We have obeyed your order of the 10th inst. relative to testing the merits of Mr. H. Schierloh's cherry heat welding compound, and have the honor to report as follows:

For welding steel and iron, it possesses great superiority over the ordinary method, in the fact that the union of the two metals can be perfected at a much lower heat, thus avoiding the danger or liability of burning and destroying the steel, which is of frequent occurence with the old method; again, as the welding can be accomplished at a much lower heat, there must necessarily be a considerable and valuable saving in time over the ordinary method of taking a welding heat. In welding iron to iron its importance is not so conspicuous.

The cost of the new compound, or flux, is some twenty-five per cent. cheaper than borax, which is commonly used for the purpose.

Respectfully submitted,
GEO. SEWELL, Chief Engineer, U. S. N.
W. L. HANSCOM, Naval Constructor, U. S. N.
DANIEL HERRICK, Foreman Shipsmith.

To Vice Admiral S. C. ROWAN, U. S. N., commanding New York Station.

Vice Admiral's Office, Navy Yard, New York. Approved July 22, 1874. R. W. SHUFELDT, Captain Commanding.

It is the intention of the inventor to conduct at one of the navy yards a series of experiments in the rolling of armor plates of iron and steel. As the union of the two metals is rendered perfect by the aid of the welding compound, and as plates thus made will be many times stronger than any previously used for ships' armor, the invention is likely to prove of great value to the government for this, as well as for general purposes in the smiths' shops of the navy yard and arsenals. We have no hesitation in saying it is the most valuable and economical welding compound we have ever seen tried, accomplishing results, especially in the union of fine steels and of iron to steel, which we have never before seen attained at any heat to which steel could safely be brought.

Spontaneous Combustion.

During the last thirty years, at least, the summer months have been noted for large conflagrations, chiefly in wharves, warehouses and mills engaged in textile manufactures. Many of the large fires that have occurred in the metropolis and some of our chief manufacturing towns have fallen under the category of "cause unknown." But in many of such cases spontaneous combustion has been probably the cause. Hence the prevalence of the large fires to which we have referred in summer time. In the Report of the British Association meeting of 1873 is a paper, which was read by Mr. Galletly, detailing a series of experiments which he had carried out for the purpose of ascertaining the heating action of various oils when present in cotton waste. According to his results, spontaneous combustion took place in cotton waste, soaked with olive oil, when submitted to a temperature of about 120° to 130° Fahr., in the course of a six hours' experiment. The government inspector, Major Majendie, remarked recently on these experiments that 'These facts illustrate the grave and urgent character of the risk which exists when oiled cotton waste is deposited, even in very small quantities, and for a very short time, in moderately elevated temperatures—such temperatures as exist in the majority of factories, in the neighborhood of a steam pipe, or under exposure to the sun's rays."

That Major Majendie's remarks are justified by experience cannot be denied, but it is a remarkable fact that "sweeps," which are the ordinary product of all cotton mills, and are soaked with oil, rarely, if ever, catch fire. These are constantly sent by scores, even hundreds of tons, by steamer and railway to London, packed in bags containing from one to one and a half hundred weight, and in no case, during the last thirty years, has a tendency, and still less a sign, of spontaneous combustion been recorded, *provided no water moisture was present.* We have seen several hundred bags of such "sweeps" piled on each other, during the whole of a hot summer, perfectly free from heating, in a place where little or no ventilation existed. But a similar class of sweeps, say, in a voyage from Aberdeen to London, placed on deck, and exposed to rain, has been received in London in such a heated state as to require unpacking and exposure to the air to allow the waste to cool down. Generally speaking, the waste to which we refer has been used in the manufacture of "waddings" after being dyed. Of course, on immersion in the dye baths of logwood, sumac, copperas, etc., all further danger from spontaneous combustion is impossible.

It is evident that spontaneous combustion of any material soaked with oil of any kind, must be simply the result of atmospheric oxidation of the carbonaceous matter of the substance. It has been generally supposed that the nature of the oil influences the result, and to some extent such may be the fact. The insurance offices recognized this by certain stipulations in reference to the character of oil employed in woolen mills. If any oil other than olive oil be used, an extra charge at the rate of 7/6 per cent. is made for one kind, and 21/ per cent. for another class of oil. This arrangement is rather amusing, for olive, linseed and most other vegetable oils are more readily oxidizable than mineral oils, which are considered more dangerous by the insurance companies than the vegetable class, although they are by far the safest.

But, beside the question of the character of the oil employed is that of pressure. If a quantity of oily waste of any kind be brought into close contact by heavy weight, the chances of spontaneous combustion are greatly increased. A singular instance illustrating this occured some years ago at the Polytechnic Institution, Regent street. A small piece of cotton waste that had been used to clean an oil lamp, had been laid aside under a pile of papers. During the hot weather of June of that year, spontaneous combustion occured. Fortunately this happened in the daytime, otherwise the consequences would have been disastrous.

A remarkable instance of spontaneous combustion which may occur at an ordinary summer temperature, say, of 78 deg. to 84 deg., is that of a mixture of chlorate of potash and sulphur, and consequently also of matches containing those substances, and also of red and green fire, which contain chlorate of potash and sulphur. This class of spontaneous combustion is more difficult to understand than those to which we have already referred. Perhaps in the same category may be placed occasional explosions of gun cotton; as, for example, that which occurred at Stowmarket, a few years ago, the cause of which has never yet been satisfactorily explained.

We are inclined to believe that one great cause of spontaneous combustion in cotton and woolen mills rests on the length of the fibre of the material left as oily waste. The finer this fibre the greater is the danger of spontaneous combustion, and this becomes evident from the fact that in such cases the particles of the materials are in closer contact. In all our large docks of London, Liverpool, etc., thousands of tons of long stapled sheep's wool imported from Australia, the Cape, and other places, full of animal oil, remain perfectly safe for years. In their transit, the bales containing such wool must have attained a temperature of at least 80° to 90°, yet we never hear of spontaneous combustion either in the ships or the docks. But then comes the question of the character of the oil—as to whether the animal or the vegetable is the more dangerous. The late Dr. Graham, in reporting on the burning of the Amazon, considered that rags greased by butter, heaped together, would take fire within twenty-four hours; so here another difficulty presents itself.

We question very much, except under the most extraordinary circumstances, whether either silk or sheep's wool is liable to spontaneous combustion, even in the presence of abundance of any kind of oil. On the contrary, cotton, jute, all kinds of hemp and flax, mixed with oil, have an invariable tendency to spontaneous combustion at summer heat. All chemists well know that vegetable substances are more readily decomposed in any way than animal substances. Of course this arises from the more ready oxidation of the ternary vegetable compounds (containing as they do only carbon, hydrogen and oxygen) than the quaternary animal compounds, consisting of the same elements combined with nitrogen. Hair, for example, will withstand decomposition for centuries, while woody fibre, even of the oak or other tree, will rarely last more than a few years if exposed to air and moisture, simply owing to the rapid oxidation of woody fibre. It is common in many of the marsh lands of this country to see the pith of a willow tree catch fire spontaneously in summer time, instances of which may be seen, for example, in the marsh land of Essex near the river Lea, and in similar places in Cambridgeshire, Bedfordshire, &c.

The only apparent remedy seems that of maintaining constant ventilation in all waste, &c., containing oil. Frequent turning is essential, and we have tried successfully the sprinkling of such waste with waste leys or lime water. It is remarkable that jute warehouses are peculiarly liable to catch fire, in fact all members of the hemp and flax family are to be more feared than varieties of cotton.

A singular cause of fire may be traced to the glass of which the windows of warehouses is made. In the old-fashioned kind the "punty" mark is found. This forms a double convex lens, which, concentrating the rays of the sun constitute a burning glass. That fire should occur from such causes can be no matter of surprise. Water bottles exposed to the sun's rays have sometimes similarly caused fires in private houses by concentrating the heat rays on dressing-table covers, &c.—*Engineering.*

Mr. Thos. H. Salmon, of Brooklyn, has lately made an improvement in stoves having a downward draught, which consists in the arrangement of a plate to form that side of the hanging grate which is opposite the smoke pipe. Through a hollow standard a pipe passes upwardly into the combustion chamber. In the latter is hung the basket grate that is provided with a removable cover, through whose holes the air is drawn to produce the down draught. One side of the basket grate is a broad plate, which comes directly between the smoke pipe and the other part of the grate. By this construction, when there is sufficient heat to create a vacuum in the chimney, a current of air rushes into holes through fuel in the grate, under the plate, and into the chimney. In order to moderate the strong draught which is thus produced, slides in the ash pan are moved so as to admit air.

Mr. J. Phillips, of Hammersmith, has received a patent for a new method of making tight joints for pipes. The joint is of the spigot and faucet kind, the spigot and faucet being made with tapering parts fitting or nearly fitting each other at the front and back of the joint, with an annular cavity between the fitting parts, which cavity is filled with cement or fused material introduced through apertures in the periphery of the faucet. To prevent escape of the filling in, rings of yarn or other yielding materials may be placed in annular grooves in the tapering parts of the spigot and faucet.

MILLERS FALLS COMPANY, No. 78 Beekman Street, New York,

BARBER RATCHET BRACE.

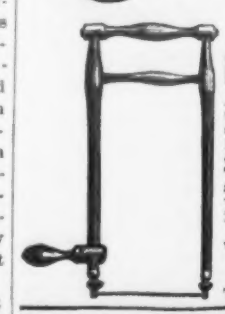
This Brace has a Lignumvitæ Revolving Handle, Wrought Iron Sweep, Malleable Iron Nut & Socket, with Cast Steel Jaws, It is beautifully MOST PERFECT In places where there is not room to revolve the sweep, a Pawls and Rachet Wheel, all respects the IN MARKET. slight back and forth motion will drive the bit in or out. Without the Ratchet attachment, and will surely come into general use. For Sale by all Hardware Dealers.

Miller's Falls Co., No. 78 Beekman St., NEW YORK.

WITH THIS BRACKET SAW

An infinite number of useful and ornamental articles can be made. It will pay for itself every day when in use. The frame is 5x12 in., and made of red cherry wood, beautifully polished. For sale at all Hardware stores.

Millers Falls Co., 78 Beekman St., N. Y.



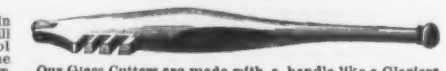
In addition to the 20 Cast Steel Tools inclosed in this handle, it will hold anything from an 8 inch Mill File to a Cambric Needle. It is by far the best Tool Holder in use, and will also answer nearly all the purposes of a Hand Vise. The wood is lignumvitæ and hard maple, the ferrule, malleable iron, and the jaws cast steel. Most hardware dealers keep them, or will send to us for them. MILLERS FALLS CO., 78 Beekman St., N. Y.

IRON CUTTERS.

This is the most powerful Cutter in use, and just what is needed by all retail iron dealers. Also by shipbuilders, manufacturers, and all others having iron to cut. It will cut iron twice as large as any other machine of the same cost.

Weight.	Cuts.	Price.
No. 1, 16 lbs.,	⅜x3 in., or ½ in. round or sq.	$25
No. 2, 165 lbs.,	⅝x3 in., or ⅝ in. " "	50
No. 3, 312 lbs.,	⅝x4 in., or 4-4 in. " "	75

GLASS CUTTERS.



Our Glass Cutters are made with a handle like a Glaziers Diamond, but, instead of the diamond point, they have a small hardened steel revolving wheel, the sharp edge of which cuts nearly as well as a diamond. They are durable, and will give entire satisfaction.

Manufacture **Barber's Bit Braces, Miller's Falls Vises, Little Giant Iron Cutters, Adjustable Chuck Breast Drills, Family Tool Chests, Pratt's Boiler Tube Scrapers, Patent Angular and Ratchet Drilling Machines, Langdon Mitre Boxes.**

HOWARD PARALLEL BENCH VISE.

MANUFACTURED BY Howard Iron Works, Buffalo, N.Y.

Send for price list.

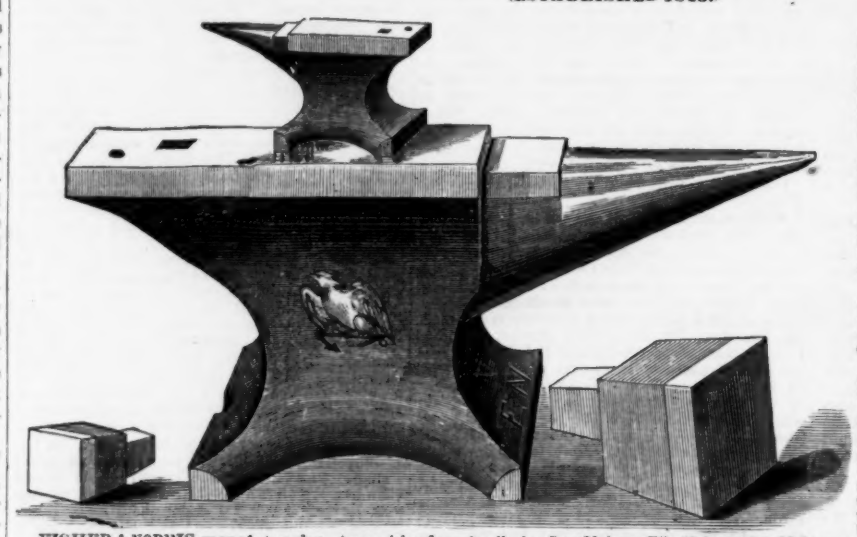
RUSSELL & ERWIN MFG. CO., New York and Philadelphia, Agents.

NOTICE.

These **Vises** are only manufactured at the **HOWARD IRON WORKS,** at **Buffalo, N. Y.** and are so stamped. The improvements in these **Vises** which are patented are valuable, and parties who claim to manufacture, and are offering a **Vise** representing it to be the same as the **HOWARD VISE,** are deceiving the Trade. HOWARD IRON WORKS.

The Fisher & Norris Eagle Anvil Works.

(ESTABLISHED 1843.)



These Anvils are manufactured at the oldest Anvil Factory in this country, and for the past twenty-five years have maintained an excellent reputation among Blacksmiths, Machinists, Tool Makers, &c. They are *superior* to the best English, or other Anvils, on account of the peculiar process of their manufacture (invented and used only by this concern), and from the quality of the materials employed.

The working surface is in *one piece* of JESSUP'S BEST TOOL CAST STEEL, which, after being accurately ground, is hardened and given the proper temper for the heaviest work. The *horn* is covered with and its extremity made *entirely of steel.* The body of the Anvil is of the strongest grade of American iron, to which the cast steel face is *warranted to be thoroughly welded and not to come off.*

The best of English Anvils, after a time, become hollowing on the face by continued hammering in use, on account of the fibrous nature of the wrought iron—causing it to "settle" under the face.

The body of the Eagle Anvils being of crystallized iron, no such settling can ever occur; and the steel face, therefore, remains perfectly true. Also, it has the great advantage that being of a more *solid* material, and consequently with less rebound, the piece being forged receives the full effect of the hammer, instead of a part of it being wasted by the rebound, as is the case from a wrought iron anvil. An equal amount of work can, therefore, be done on this Anvil with a *hammer one fifth lighter* than that required when using a wrought iron anvil which is more elastic.

FISHER & NORRIS manufacture also, to special order, Anvils for Saw Makers, File Makers 'Axe Makers, &c; also, Copper Smiths', Silver Smiths' and Tinmen's Stakes and Blocks, with hardened and polished cast steel faces, and the well known Double Screw Parallel Vise.

REDUCED PRICE LIST, November 1st, 1873.
ANVILS weighing 100 lbs. to 800 lbs., 11 cts. per lb.

Smaller Anvils, ("Minims.")

No. 0	1	2	3	4	5	6	7	8	9
Weighing about 10 lb.	15 lb.	20 lb.	30 lb.	40 lb.	50 lb.	60 lb.	70 lb.	80 lb.	90 lb.
Price, $3·50	$4·25	$5·00	$5·50	$6·50	$7·50	8·00	$9·00	$10·00	$10·50

THESE GOODS ARE SOLD BY OUR AGENTS (with special discounts to the trade).

New York.—Messrs. CLARK, WILSON & CO.—RUSSELL & ERWIN MANUFACTURING COMPANY.—Messrs. HORACE DURRIE & CO. Boston.—Messrs. GEORGE H. GRAY & DANFORTH. Philadelphia.—Messrs. JAMES C. HAND & CO. Baltimore.—Mr. W. H. COLE.

FISHER & NORRIS, Trenton N. J., Manufacturers.

THE Wethersfield Novelty Co., Manufacturers of Builders' Hardware AND PLATED GOODS, Wethersfield, Ct.

Brass and Iron Founding. Light Castings for outside parties a specialty. **Gold, Silver, Nickel and Bronze Plating.** Orders solicited. Communication from Hartford by Horse or Steam Cars.

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"Patented" Furnace Charging Scale.

Double Beam R. R. Track Scale, Compound Parallel Crane Beams, &c. Patented First Power Lever Wagon Scales. Testing Machines any capacity.

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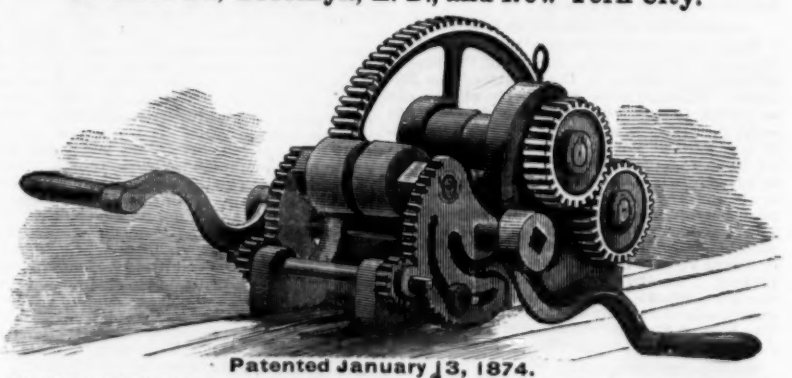

Patented January 13, 1874.

This Machine is destined to supersede all Tire Benders now in use, especially for heavy work. The middle roller can be readily removed and readjusted, thus allowing Tires to be withdrawn without difficulty after being bent. Fifth Wheels and Tires never slip while being bent in this Machine. One man can bend a Tire 8x1 without difficulty.

Manufacture Carriage Materials, Axles, Springs, Blacksmiths' Supplies, Bolts, Wood Work, Trimmings, &c.

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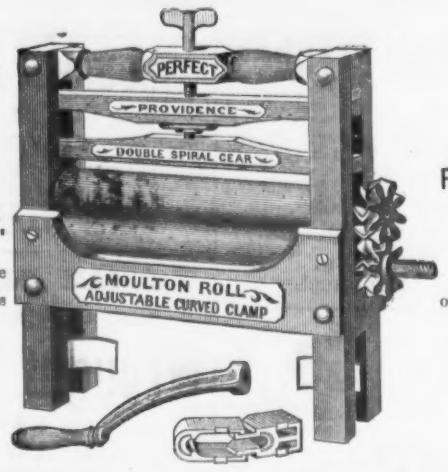

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Covers more surface on all kinds of articles than any in market.

ALL WHITE Rolls, Double Cogs, V Shape.
Cannot be thrown out of gear on either end.

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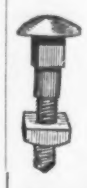

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all kinds of
Machine and Plow Bolts,
FORGED SET SCREWS AND TAP BOLTS.

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HARDWARE HOUSE,
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Bonney's Pat. Hollow Augers & Spoke Trimmers.
Bonney's Patent Double-Edged Spoke Shave.
Bonney's Patent Adjustable Gate Hinge.
Bonney's Patent Sash-Fast and Lamp Bracket.

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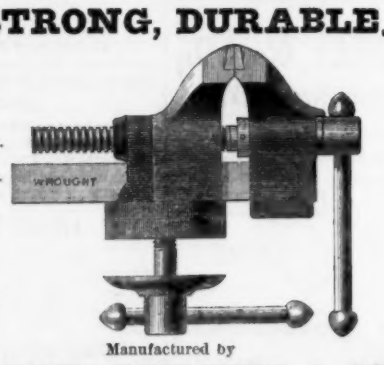
PARALLEL SWIVEL VISE,

STRONG, DURABLE.

Wrought Iron Bar.

Width of Jaw.	Weight.	Solid Box. Price.
4 in.	50 lbs.	$11·00
5 "	80 "	13·00
6½ "	130 "	17·00
8 "	167 "	22·00



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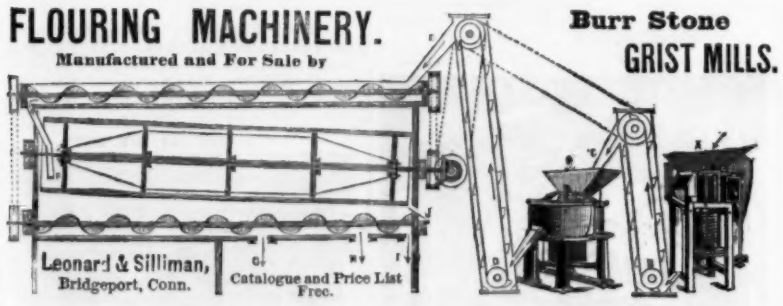

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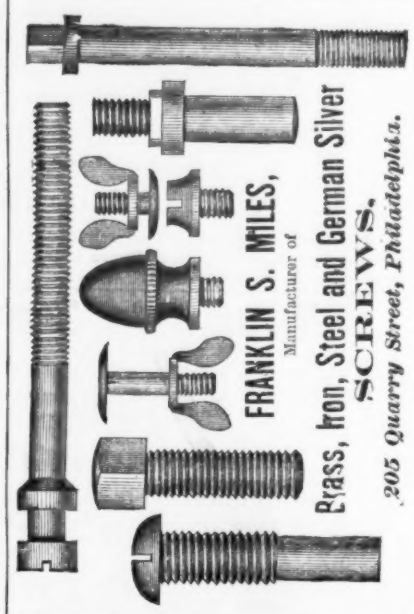

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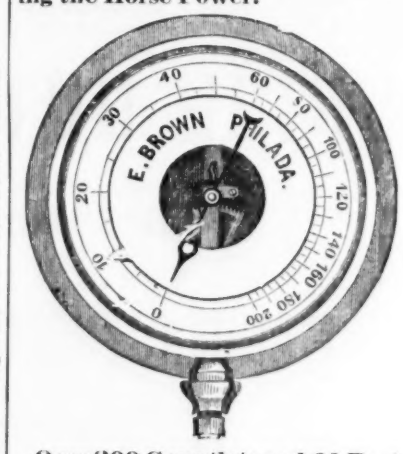

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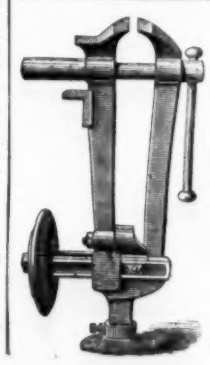

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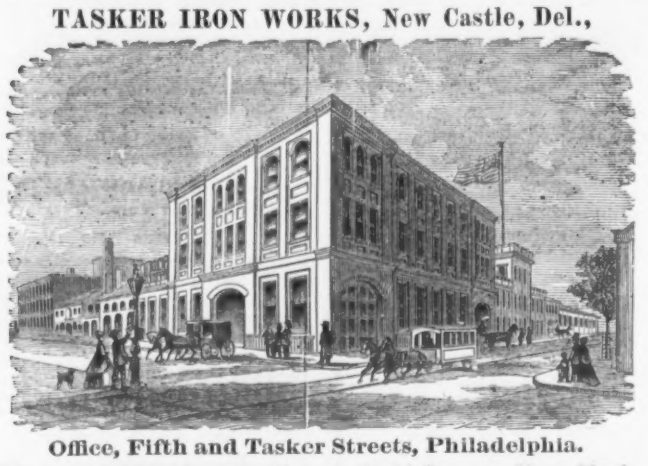

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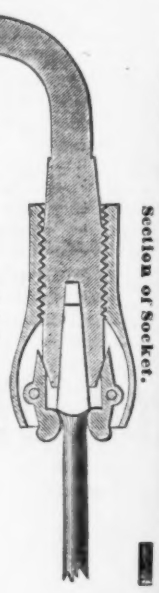

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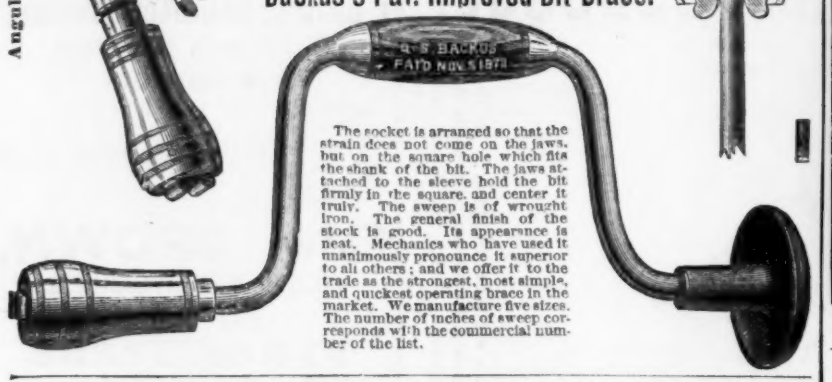

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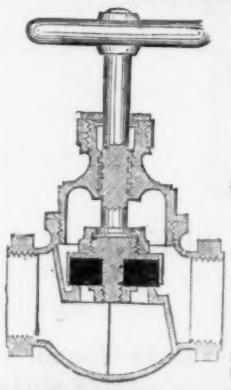

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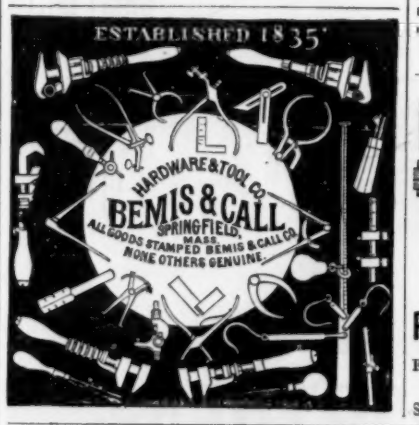

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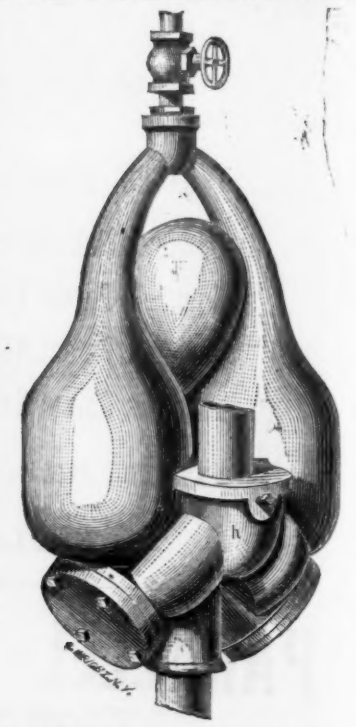

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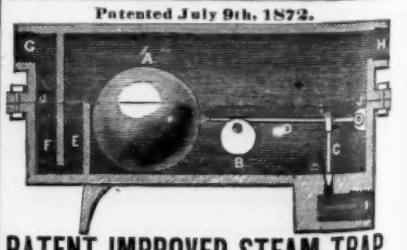

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Palmer, Newton & Co., Albany, N. Y. 23
Salamander Works of Woodbridge, N. J., foot of Bethune St., N. Y. 23
Watson John R. Perth Amboy, N. J. 23

Fishing Tackle.
Shipley A. B. & Son, 503 Commerce, Phila. 3

Fluting Machines.
Felder Chas., 105 Reade N. Y. 10
Meyers Mfg. Co., 200 Centre, N. Y. 10

Flint and Emery Paper and Cloth.
Baeder Adamson & Co., 730 Market, Phila. 30

Galvanized Iron.
Lefferts Marshall Jr., 90 Beekman, N. Y. 4
Whitnum S., Greenpoint, L. I. 4

Giant Nail Extractor.
Maltby, Curtiss & Co., Waterbury, Ct. 9

Glass. *Importers of.*
Downing A. C. & Co., 57 Beekman, N. Y. 27

Governors.
Shive Governor Co., Bethlehem, Pa. 31

Grindstones.
Wood Walter R., 283 and 285 Front, N. Y. 28

Guns, &c
Tryon Edw. K., Jr., & Co., 19 N. Sixth, Philadelphia. 2
Windmuller Louis & Roelker, 20 Reade, N. Y. 20

Gunpowder. *Makers of.*
Kneeland F. L. (Dupont) 70 Wall, N. Y. 32
Laflin & Rand Powder Co., 21 Park Row, N. Y. 34

Hammers, etc., *Manufacturers of.*
Emmet Hammer Co., Brooklyn, E. D., N. Y. 3
Nelson Tool Works, 157 E. 32d, N. Y. 3

Hardware, *Brass and Galvanized.*
Tiebout W. & J., 230 Pearl, N. Y. 2

Hardware. Commission Merchants.
Fernald & Sise, 100 Chambers, N. Y. 8
Green R. M., 100 Chambers, N. Y. 29
Graham & Haines, 88 Chambers, N. Y. 30
Walbridge Geo. B., 99 Chambers, N. Y. 27
Walsh, Coulter & Flagler, 88 Chambers N. Y. 8

Hardware Dealers.
Lloyd, Supplee & Walton, 625 Market, Phila. 21
Quackenbush, Townsend & Co., 59 Reade, N. Y. 29
Shepard Sidney & Co., Buffalo, N. Y. 27
Turner, Seymour & Judds, 64 Duane, N. Y. 8

Hardware Importers.
Beam & Murray, 93 Chambers, N. Y. 29
Boker Hermann & Co., 101 Duane, N. Y. 29
Field Alfred & Co., 47 John, N. Y. 9
King H. & J. W., 80 Chambers, N. Y. 10
E. Frith, 16 Cliff, N. Y. 10
Van Wart & McCoy, 43 Chambers, N. Y. 10
Turner R. A., 37 Chambers, N. Y. 11
Windmuller Louis & Roelker 20 Reade N. Y. 20

Hardware Manufacturers.
Biddle Mfg. Co., 78 Chambers, N. Y. 31
Enterprise Mfg. Co., Phila. 30
Hart, Bliven & Mead Mfg. Co., 243 Pearl, N. Y. 32
Jacobus & Nimick Mfg. Co., 96 Chambers, N. Y. 28
Kellogg Wm. P. & Co., Troy, N. Y. 34
Lane, Gale & Co., Troy, N. Y. 8
Many & Marshall, 48 Warren, N. Y. 8
Middletown Tool Co., 82 Chambers, N. Y. 13
Miller's Falls Mfg. Co., 78 Beekman, N. Y. 20
Pratt & Co., Buffalo, N. Y. 27
Providence Tool Co., 11 Warren, N. Y. 21
Schweitzer Mfg. Co., 57 Reade, N. Y. 29
Shattuck W. F. & Co., 113 Chambers, N. Y. 8
Stanley Works, 79 Chambers, N. Y. 29
The Wethersfield Novelty Co., Wethersfield, Ct. 33
Turner, Seymour & Judds, 64 Duane, N. Y. 8
Union Mfg. Co., 99 Chambers, N. Y. 7
Williams, White & Churchill, 73 Warren, N. Y. 24
Wilson Mfg. Co., 37 Chambers, N. Y. 12

Hardware Specialties.
Byington & Northup, Rochelle, Ills. 34
Markt & Co., 139 Centre, N. Y. 28
Pugsley & Chapman, 6 Gold, N. Y. 36
Shepard Sidney & Co., Buffalo, N. Y. 27
Wiley & Russell, Greenfield, Mass. 21

Helve Hammers, *Makers of.*
Bradley Mfg. Co., Syracuse, N. Y. 24

Hoisting Engines. *Makers of.*
Howard Geo. C., 17 S. 18th, Philadelphia. 36
Otis Bros. & Co., 348 Broadway, N. Y. 9
Todd & Rafferty Machine Co. 10 Barclay, N. Y. 34

Horse Hay Forks and Fixtures, *Makers of.*
McDonald & Gordon, Rushford, N. Y. 5
Nellis A. J. & Co., Pittsburgh, Pa. 36

Horse Nails. *Makers of.*
Ausable Horse Nail Co., 35 Chambers, N. Y. 31
Brundage & Co., Middletown, N. Y. 10
Globe Nail Co., Boston, Mass. 31
Pratt & Co., Buffalo, N. Y. 27
Putnam S. S. & Co., Neponset, Mass. 3

Horse Shoes. *Makers of.*
Burden Iron Works, Troy, N. Y. 4

House Furnishing Goods.
Tift & Howard, 12 Murray, N. Y. 30

Hydraulic Jacks.
Dudgeon Richard, 24 Columbia, N. Y. 24

Insurance, Boiler.
Hartford Steam Boiler and Inspection Co. 33

Insurance, Fire.
Amazon Insurance Co., Cincinnati, O. 4

Iron Brokers.
Boynton Geo. A., 70 Wall, N. Y. 6
Crane U. O., 104 John, N. Y. 2
Hazard & Jones, 212 Pearl, N. Y. 4
Read & Dickey, Cleveland, O. 36

Iron, Corrugated, *Manufacturers of.*
Corrugated Metal Co., East Berlin, Conn. 4
Mosely Iron Bridge and Roof Co., 5 Dey, N. Y. 4

Iron, Charcoal, *Warm or Cold Blast.*
Quincy John W., 98 William, N. Y. 4

Iron Commission Merchants.
Althouse & Umberzer, 341 Walnut, Philadelphia. 5
Blakiston & Cox, 333 Walnut, Phila. 5
Hand Jas. C. & Co., 614 and 616 Market, Phila. 29
Hoopes W. Graham, 419 Walnut, Phila. 5
Malin Bros., 228 Dock, Phila. 5

Iron, Pig, *Importers of.*
Williamson James & Co., 69 Wall, N. Y. 4

Iron Dealers.
Abeel Brothers, 190 South, N. Y. 4
Bonnell, Botsford & Co., Youngstown, O. 4
Borden & Lovell, 70 and 71 West, N. Y. 4
Cleveland, Brown & Co., Cleveland, O. 6
Coddington T. B. & Co., 25 Cliff, N. Y. 4
Conklin & Huerstel, 99 Market Slip, N. Y. 4
Fuller, Lord & Co., 139 Greenwich, N. Y. 4
Fuller, Dana & Fitz, 110 North, Boston. 2
Gardner Wm., 575 Grand, N. Y. 4
Harrison & Gilloon, 558 to 562 Water, N. Y. 4
Hart G. A., 208 Walnut, Phila. 5
Holden, Hopkins & Stokes, 101 John, N. Y. 4
Jackson & Chase, 206 and 208 Franklin, N. Y. 4
Judson B. F., 457 and 459 Water, N. Y. 4
Matthews Chas. W., 133 Walnut Phila. 5
Mohr J. J., Philadelphia. 5
Packard, Goff & Co., Youngstown, O. 4
Pettee & Mann, 228 and 229 South, N. Y. 4
Pfefferle John F., 531 Water, N. Y. 4
Pierson & Co., 24 Broadway, N. Y. 4
Quiney John W., 98 William, N. Y. 4
Richards D. W. & Co., 92 Mangin St., N. Y. 4
Smith Gam'l G. & Co., 342 Pearl, N. Y. 4
Warner A. B. & Sons, 28 and 29 West, N. Y. 4
Williamson James & Co., 69 Wall, N. Y. 4
Whitney Alfred R., 58 Hudson N. Y. 4

Iron, *Manufacturers of.*
Britannia Iron Works, Middlesbro', Eng. 4
Burden Iron Works, Troy, N. Y. 4
Cleveland Rolling Mill Co., Cleveland, O. 6
Coffin Wm. E. & Co., 8 Oliver, Boston. 4
Boston Rolling Mills, 17 Batterymarch, Boston. 4
Everson, Graff & Macrum, Pittsburgh, Pa. 4
Fulton S. & Co., 242 S. Third, Phila. 5
Girard Rolling Mill Co., Girard, O. 4
Leonard John, 450 & 451 West st., N. Y. 4
Milwaukee Iron Co., Milwaukee, Wis. 6
New Haven Rolling Mill Co., New Haven, Ct. 6
Old Dominion Iron & Nail Works Co., Richmond, Va. 6
Oxford Iron Co., 81 Washington, N. Y. 4
Phœnix Iron Co., 410 Walnut, Phila. 5
Rowland Wm. & Harvey, Phila. 36

Iron, Swedish. *Importers of.*
Jessop Wm. & Sons, 91 and 93 John, N. Y. 32
Mitander Nils, 60 William, N. Y. 4

Lace Leather, *Manufacturers of.*
Stoyle Wm. H., 403 Library, Phila. 10

Lanterns. *Manufacturers of.*
Dietz R. E., (Tubular) 54 and 56 Fulton, N. Y. 24
Howard & Morse, 45 Fulton, N. Y. 2

Lawn Mowers. *Manufacturers of.*
Chadborn & Coldwell Mfg. Co., Newburgh, N. Y. 12

Lead Kettles.
Phillips Thos. & Co., Providence, R. I. 2

Locks, *Manufacturers of.*
Bohannan Wilson, Broadway and Kossuth, Brooklyn, E. D. 2
Branford Lock Works, Branford, Conn. 12
Norwich Lock Co., Norwich, Conn. 6
Romer & Co., Newark, N. J. 32
Trenton Lock Co., 48 Warren, N. Y. 6
Yale Lock Mfg. Co., 298 Broadway, N. Y. 30

Machinery, *Makers of.*
Bement Wm. B. & Son, Philadelphia. 35
Chapin Machine Co., New Hartford, Conn. 35
Goodspeed & Wyman, Winchendon, Mass. 34
Place George & Co., 121 Chambers, N. Y. 31
Pratt & Whitney Co., Hartford, Conn. 34
Sellers Wm. & Co., 1600 Hamilton, Phila. 25
Watson Andrew, 597 Dickinson, Phila. 25
Wetherill Robert & Co., Chester, Pa. 34
Wood Thomas, 2106 Wood, Phila. 35

Machinery Oils.
Ney Wm. F., New Bedford, Mass. 30

Machine Screws, *Makers of.*
American Screw Co., Providence, R. I. 13
Lyon & Fellows Mfg. Co., Williamsburg, N. Y. 28

Machinists.
Demarest, Joyce & Co., Brooklyn, E. D. 9

Machinists' Tools, *Makers of.*
Blaisdell P. & Co., Worcester, Mass. 35
Harrington Edwin, 15th st. and Pa. ave., Phila. 34
Star Tool Co., Providence, R. I. 34

Machinery and Tool, *Importers of.*
Churchill Charles & Co., 28 Wilson St., Finsbury, London, England. 9

Mathemathical Instruments.
Keuffel & Esser, 116 Fulton, N. Y. 36

Measuring Tapes.
Eddy Geo. & Co., 353 Classon Ave., Brooklyn, N. Y. 10

Meat Cutters. *Makers of.*
Whittemore D. H. Worcester, Mass. 7

Metal Dealers and Brokers.
Coddington T. B. & Co., 25 and 27 Cliff, N. Y. 2
Cort N. L. & Co., 220 & 222 Water, N. Y. 2
Crane C. O., 104 John, N. Y. 4
Gregg H. L. Co., 108 Walnut, Phila. 4
Holmes & Lissberger, 255 & 257 Pearl, N. Y. 2
Phelps, Dodge & Co., Cliff, bet. John & Fulton, N. Y. 2
Purves A. & Son, cor. South and Penn, Phila. 16
Quincy J. W., 98 William, N. Y. 2
Thomson & Co., 213 and 215 A. A. Water, N. Y. 3
Van Wart & McCoy, 43 Chambers, N. Y. 2

Metallurgists.
Britton J. Blodgett, 339 Walnut, Phila. 5
Drown Thomas M., 1123 Girard, Phila. 5
Maynard & Van Rensselaer, 24 Cliff, N. Y. 5
School of Mines, E. 49th, N. Y. 5

Mining Spikes
Roseberry Geo. D., Pottsville, Pa. 4

Molders' Tools.
Carter H. & Sons, 290 Pearl, N. Y. 27

Mouse Traps, Catchemalive, *Makers of.*
Dietz R. E., 54 and 56 Fulton, N. Y. 36

Nickel Platers.
New York Nickel Plating Co., 133 West 25th, N. Y. 23

Norway Shapes, *Rollers of.*
Rowland Wm. & Harvey, 948 Beach, Phila. 36

Note Broker.
Gallaudet F. W., 3 and 5 Wall, N. Y. 2

Nuts, Bolts, etc., *Makers of*
American Bolt Co., 210 Lawrence, Lowell, Mass. 13
Arms, Bell & Co., Youngstown, O. 4
Carpenter David, 402 Water N. Y. 12
Clark Bros. & Co., Milldale, Conn. 4
Fuller, Lord & Co., Boonton, N. J. 12
Haskell W. H. & Co., Pawtucket, R. I. 4
Old Colony Rivet Works, 116 Chambers, N. Y. 21
Roseberry Geo. D., Pottsville, Pa. 12
Russell, Birdsall & Ward, Port Chester, N. Y. 4
Plumb, Burdict & Barnard, Buffalo, N. Y. 36
Sternbergh J. H., Reading, Pa. 36
Union Nut Co., 78 Beekman N. Y. 21

Oilers. *Makers of.*
Austin J. & Co., 168 Fulton, N. Y. 22

Old Iron, etc.
Gregg H. L. & Co., 108 Walnut, Philadelphia. 21

Ore Crushers.
Blake Crusher Co., New Haven, Ct. 5

Paints.
Rocky Mountain Vermillion Paint Co., Prov., R. I. 34

Paints and Oils, *Dealers in.*
DeVoe F. W. & Co., 117 Fulton, N. Y. 3

Patent Solicitors.
Howson & Son, Phila. and Washington, D. C. 12
Whitney J. A., 128 Broadway, N. Y. 12

Picture Nails, etc., *Manufacturers of.*
Richards T. C. & Co., 47 Murray, N. Y. 3

Pipe Felting.
Vegetable Felting Co., 73 Beekman, N. Y. 23

Pipes, Fittings, etc., *Makers of.*
Eaton & Cole, 58 John, N. Y. 22
McNab & Harlin Mfg. Co., 56 John, N. Y. 22
Nelson, Finkel & Co., 439 E. 10th st., N. Y. 22
Pancoast & Maule, 227 Pear, Phila. 22
Chas. Gregg Mfg. Co., 62 and 64 Gold, N. Y. 22

Pipe, Water and Gas, *Makers of.*
Brick R. A. & Co., 112 Leonard, N. Y. 6
Graff William & Co., Pittsburgh, Pa. 22
McNeal John & Sons, Burlington, N. J. 6
Morris, Tasker & Co., 15 Gold, N. Y. 22
National Tube Works Co., 78 William, N. Y. 22
Starr Jesse W. & Sons, Camden, N. J. 6
Warren Foundry & Mach. Co., Phillipsburg, N. J. 22
Wood R. D. & Co., 173 Broadway, N. Y. 2

Piston Packing.
Canfield John & Co., 131 Fairmount Ave., Phila. 30

Plane Irons. *Manufacturers of.*
H. Chapin's Son, Pine Meadow, Conn. 6
Middletown Tool Co., Middletown, Conn. 8
Sandusky Tool Co., Sandusky, O. 30

Planes. *Manufacturers of.*
H. Chapin's Son, Pine Meadow, Conn. 6
Greenfield Tool Co., Greenfield, Mass. 30
Ohio Tool Co., Columbus, O. 23
Stanley Rule & Level Co., 35 Chambers, N. Y. 22

Plumbago Lubricator.
N. Y. Black Lead Works, 172 Forsyth, N. Y. 36

Plumbers' Materials, *Manufacturers of.*
Carr Wm. S. & Co., 106 Centre, N. Y. 22

Portable and Stationary Forges
Kellogg Wm. P. & Co., 121 Chambers N. Y. 34
Keystone Portable Forge Co., 120 Exchange place, Philadelphia. 6
Manning H. S. & Co., 111 Liberty, N. Y. 21

Presses, Power. *Makers of.*
Am. Saw Co., Trenton, N. J. 36
The Stiles & Parker Press Co., Middletown, Ct. 35

Pressure Blowers. *Makers of.*
Sturtevant B. F., 72 Sudbury, Boston. 35

Pumps, *Makers of.*
Burlingham & Purdy, 105 Chambers St. 7
Douglas W. & B., Middletown, Conn. 7
Rumsey & Co., Seneca Falls, N. Y. 7
Union Mfg. Co., 99 Chambers, N. Y. 7
Valley Mch. Co., Easthampton, Mass. 7

Pyrometers.
Brown Edward, 311 Walnut, Phila. 21

Railroad and Miners' Tools.
Hogan, Clark & Sleeper, Boston. 9

Rails, *Importers of.*
Congreve Chas. & Son, 104 and 106 John, N. Y. 32
Smith Gilead A. & Co., 62 Broadway, N. Y. 4

Rails, Iron or Steel. *Makers of.*
Atkins Bros., Pottsville, Pa. 6
Cambria Iron Co., Johnstown, Pa. 5
Cleveland Rolling Mill Co., Cleveland, O. 6
Griswold John A. & Co., Troy, N. Y. 32
Milwaukee Iron Co., Milwaukee, Wis. 6
Springfield Iron Co., Springfield, Ills. 4

Razor Straps, *Makers of.*
B. F. Badger, Charlestown, Mass. 6

Refrigerators.
Lesley Alex. M., 224 W. 23d, N. Y. 13

Rivets.
Old Colony Rivet Works, 116 Chambers, N. Y. 12
Timmes Peter, 281 North 6th, Brooklyn, E. D. 4

Rolling Mill Machinery, etc., *Manufacturers of.*
Moore James, Cor. 16th and Buttonwood, Phila. 35

Rolls, Chilled and Sand, *Makers of.*
Garrison A. & Co., Pittsburgh, Pa. 4

Rules, *Manufacturers of.*
H. Chapin's Son, Pine Meadow, Ct. 6
Stanley Rule and Level Co., 35 Chambers St. 22

Sash Chain.
Thomas Morton, 15 Murray, N. Y. 8

Saws. *Makers of.*
Atkins E. C. & Co., Indianapolis, Ind. 16
American Saw Co., Trenton, N. J. 10
Boynton E. M., 80 Beekman, N. Y. 10
Flint J., Rochester, N. Y. 10
Disston Henry & Sons, Phila. 25
McNeice Wm., 515 Cherry, Phila. 10
James Ohlen, Columbus, O. 10
Peace Harvey W., Williamsburg, N. Y. 16
Spear & Jackson, 116 Duane, N. Y. 29
Wheeler, Madden & Clemson, Middletown, N. Y. 10

Saw Frames, Wood, *Makers of.*
Boynton E. M., 80 Beekman, N. Y. 10
Peace Harvey W., Williamsburg, N. Y. 10

Scales, *Manufacturers of.*
Ritchie Bros., 9th near Coates, Phila. 20
Shattuck W. F. & Co., 113 Chambers, N. Y. 8

Screws, *Makers of.*
American Screw Co., Providence, R. I. 13
Miles F. S., 206 Quarry, Phila. 21

Screws, *Importers of.*
Bruce Geo. W., 1 Platt, N. Y. 10
Field Alfred & Co., 47 John, N. Y. 38
Gueutal George & Son, 39 W. 4th, N. Y. 10

Shovels, &c.
Birmingham Shovel Co., 31 Chambers, N. Y. 9
Clement & Hawkes Mfg. Co., Northampton, Mass. 4

Skates.
Graham & Haines, 88 Chambers, N. Y. 30

Smelting Works.
Reeves Paul S., 760 South Broad St., Phila. 36
Du Plaine & Co., 1330 Callowhill, Phila. 31

Stamped and Japanned Tin Ware.
Schelder Jos. & Co., 28 Beekman, N. Y. 6
Shepard Sidney & Co., Buffalo, N. Y. 27

Steam Hammers, etc., *Makers of.*
Dudgeon Richard, 24 Columbia, N. Y. 32

Snaps, Harness. *Makers of.*
Middletown Tool Co., Middletown, Conn. 28

Speed Indicators, *Makers of.*
Connecticut Cutlery Co. Naugatuck, Conn. 13

Spiegel.
Quincy John W., 98 William, N. Y. 2

Squares, Steel and Iron, *Makers of.*
Hart, Bliven & Mead Mfg. Co., 243 Pearl, N. Y. 9

Steam Pumps, etc., *Manufacturers of.*
Carr A. 43 Cortlandt N. Y. 29
Guild & Garrison, Williamsburgh, N. Y. 34
Hall C. Henry & Co., 20 Cortlandt, N. Y. 22
Philadelphia Hydraulic Works, Evelina street, east of Third street, Phila. 12
Steele & Condict, 88 Liberty, N. Y. 29

Steam Traps.
Alonzo L. Jones, 150 S. 4th, Phila. 22

Steel Castings.
The McHaffie Steel Castings Co., Evelina and Levant Streets, Philadelphia. 16

Steel Importers.
Carr J. & Riley, 82 John, N. Y. 32
Cocker Bros., Sheffield, England. 32
Congreve Chas. & Son, 104 and 106 John, N. Y. 32
Hobson Francis & Son, 97 John, N. Y. 32
Jessop Wm. & Sons, 91 and 93 John, N. Y. 32
Moss F. W., 80 John, N. Y. 32
Piersons & Co., 24 Broadway, N. Y. 4
Sanderson Bros. & Co., 16 Cliff, N. Y. 32
Sanderson Geo. & Co., 57 John, N. Y. 32
Van Wart & McCoy, 43 Chambers, N. Y. 32
Wardlow S. & C., 18 Gold, N. Y. 32
W. Hawksworth, Ellison & Co., 72 John, N. Y. 32

Steel Manufacturers.
Anderson & Woods, Pittsburgh. 33
Chrome Steel Co., Brooklyn, E. D. 32
Cleveland Rolling Mill Co., Cleveland, O. 6
Gautier D. G. & Co., Jersey City, N. J. 32
Griswold John A. & Co., Troy, N. Y. 32
Hussey, Wells & Co., Pittsburgh. 33
Miller, Barr & Parvin, Pittsburgh. 34
Reiter, Sutton & Co., Pittsburgh, Pa. 33
Reese, Graff & Woods, Pitt

Curiosities of Heating and Heating Apparatus.

We condense the following interesting article from the *Exchange and Review*:

It seems singular, that in an age teeming, as does ours, with invention, the science of warming and ventilating houses is not more generally understood. The United States and England have made the greatest advance in this department, and steam, hot air and hot water modes, coal and wood stoves (of innumerable plans), low down grates and gas stoves have, in these two nations, attained great excellence; but, however well all these may be known and used in the cities, towns and villages of the United States, there are still in vogue in portions of some States and Territories and remote districts, the most wasteful modes of heating—possibly we might add the most ancient modes, for they certainly have a very respectable antiquity.

In the eighteenth century, wood fires on open hearths were almost universal—though some soft coal and charcoal were used to a limited extent—and when Franklin, about eighty years ago, invented a cast iron fireplace for wood, projecting into the room, and having a downward flue to check the draught of the chimney, it was considered a great triumph of inventive skill. The "ten-plate" wood stove, with its capacious oven and double doors on each side, followed, and it was undoubtedly the parent and suggestion of all the multitudious cooking stoves and ranges since invented. This good and simple contrivance, or some contrivances much resembling it, are still used extensively; and in New England, in many places, churches and halls are heated by placing two of them in a front vestibule, and carrying the pipes through the whole length of the building to a chimney. The result is economy, and a temperature in the churches, during winter, slightly above 32° F.

It was the discovery of anthracite coal which gave a decisive impetus to invention in the perfection of combustion and economy; and there are many still living who remember the introduction of coal and the previous wood fires, with iron or brass andirons, the inevitable bellows, and the dust brushes. They will recall the picture of the dusky sweep-boy chanting from the top of the chimney, the great prejudice against the hard fuel, the futile attempts to burn what seemed stone, and then the advent of the common open grate, with a supplemental top bar and sheet iron front—admirable arrangements for burning faces and freezing backs, and, withal, as wasteful a mode as could well have been devised. The soft bituminous coal was somewhat used in England three centuries before the discovery of anthracite in Pennsylvania, and there is reason to believe the Romans used it in England. On the continent it was much less employed, and for many years was greatly disliked in France. Burning, however, with comparative ease, so long as it could be consumed in simple grates our ancesters were satisfied; but the refractory anthracite, from its very nature, seemed to incite modern invention.

With the most recent appliances, there is no difficulty in maintaining, in the largest buildings, an equable summer heat during the coldest weather, and if the means and disposition permit, by the use of fans and ice chambers, a cool atmosphere can be produced in summer.

It would be supposed that such comfort in heating would spread with rapidity through all the cold and temperate climates, but such has not been the case, for, outside of the United States and England, the progress has been slow. In most of the cities of Europe, and, indeed, throughout the continent, the people cling tenaciously to the old style of tile stoves for burning wood or coal, which, although the heat yielded is pleasant, are very cumbrous and expensive. In parts of Europe and Asia, where it would be supposed that means of heating are very requisite, scarcely any attention is paid to a subject so important. In Spain and Italy, until quite recently, no preparation would be made for heating in winter, except a dish of burning charcoal placed in the center of the tile floor of a room. Such floors, although admirable for their safety from fire, certainly make an unheated chamber much more cheerless. In fact, it is strange how little, throughout all Europe, except among the wealthy, the health and comfort arising from properly heated apartments is regarded. In Russia and other very cold countries (and *not* including the half civilized Esquimaux and Laplanders), where some heat must be maintained in winter to prevent freezing to death, the mass of people frequently use a large oven with a flat top, and heated at an opening outside the house. The cooking and baking are done in this oven, and upon the top of it the whole family sleep at night, without removing the daily clothing. It requires a dull olfactory to stand the odors which greet the nostrils in these abodes, but the Russians are not nice on this point. Years ago, at a grand *fete* in one of the palaces at St. Petersburg, there was great need of more space, but, although a large and handsome room was close at hand, it was not heated, nor was there any means therefor. Queen Catherine did not know what to do, but the able major-domo told her the apartment should be ready in less than an hour. He collected five hundred of all kinds of palace servants, and others, whom he pressed into service, and thrust them into the room. In half an hour their bodily heat had sufficiently warmed it, and the attendant odor being neutralized by some perfumes and natural flowers, the much needed space was soon occupied by the gay nobility. In Paris, one of the most expensive parts of housekeeping is that of heating arrangements, and in winter there is, in general, no approach to the comfort which even persons in humble life enjoy in all our cities.

It is well known that the inhabitants of Arctic regions, the savages of Africa and America, and a large class of people in Ireland and some other parts of the world, live in huts or tents, which have a hole in the top to allow the smoke to escape if it will, while the fire is made in a depression in the earthen floor.

Chimneys were not used at all among the most ancient nations, and not commonly even with the Greeks and Romans. Only the rich of the latter nation used them (the Greeks hardly ever used them), and then chiefly for the hypocaust, which was a large, flat oven, or chamber, supported by many short pillars of brick, and used to heat the tiled floors of rooms and baths. To these ovens the fire was applied outside, and, from the thickness of the arched floors, this heating could not have been very effective. Sometimes diverging flues heated the floors of other rooms in a manner still less thorough. The kitchens were generally large—sometimes 145 feet in length—and with high ceilings, having an opening at the top to allow the egress of smoke. The absence of chimneys is proved by the excavations of Pompeii and Herculaneum, where very few are found; by all ancient ruins, and the silence of ancient authors on the subject. Even the fine villa of Pliny, at Laurentium, was scarcely heated at all. There was only one small hypocaust, and the historian and his family depended almost entirely for warmth in winter on one room, which had a southern exposure and a large bay window. All this he describes in his own writings. Vitruvius does not mention a chimney to carry off smoke, and Columnella states that the roofs of kitchens were made high to prevent the timbers being burned. This precaution would have been unnecessary if chimneys had been used. Horace describes such an accident happening when the landlord of an inn made a large fire to cook birds quickly for Mæcenus [Lib. 1, Sat. 5.] He, as well as Juvenal, often refers to smoky houses, and the word *atrium*, or hall, had its origin from the walls of those places being blackened by smoke [Isidorus, xv 3.] The habitations of people of the middle class were represented as black with smoke stains, interiors always smoky, and Columnella speaks of the "soot which adheres to the roof" [De Re Rustica, 1, 17.]

There are some fine remains of hypocausts in England. At Withington is one 27½ feet long by 19 feet wide, the brick piers being 8 inches square, and the average distance between them 14 inches. In one at Rodmarton, the hight is 21 inches. There are also similar remains at Wroxeter, Cirencester (32 by 24 feet), Chester, Dover, and other places; and what appeared to be cinders of coal or coke were occasionally found. In a villa under the river Eske five out of seven of the rooms of the ruin had hypocausts under them. The finest specimen of ancient heating in England was at Woodchester, where a villa, built, it is believed, by order of the emperor Adrian, contained 65 apartments, and all the rooms and passages were heated either by hypocausts or flues from them. The Romans also often used over their kitchen fires the same kind of large pyramid, or cone, which is still very common in German interiors.*

It is somewhat doubtful whether the custom of using chimneys generally came into vogue first in Italy, but the weight of evidence seems to be on that side. They had become numerous in Venice in the year 1347, for an inscription over the gate of the school of Santa Maria della Carita states that in the said year many chimneys (*molte camini*) were thrown down by an earthquake. They had also been in use at Padua before 1368, for Galeazo Gataro, in his history, says, in that year Francisco Carraro, lord of Padua, came to Rome, and finding no chimneys at the inn where he lodged, because at that time fire was kindled in a sunken portion of the earthen floor, caused two chimneys, like those which had long been used in Padua, to be constructed. Over these—the first ever seen in Rome—he affixed his coat of arms, which was there in the time of Gataro [Hist. p. 109.] The Venetian chimneys were often built outside, as single towers or clusters of columns, and were frequently highly ornamental. Sometimes a single one from the outside of an upper story was supported on a corbel. This irregular and fanciful architecture was afterward imitated in the early Tudor styles in England, and still lends a singular charm to the old houses that remain. The Italians afterward built flues in walls, which latter were of enormous thickness. In France and England, the first chimneys in ordinary houses projected inward, as each story rose, instead of being, as now, ranged flat against the wall. This may probably be the reason of the projection of upper stories over the foundation, so common in very old houses; for the amount of room taken up by the clumsy, in-projecting masonry, was very considerable. In some old main streets in Europe opposite neighbors can shake hands together from their upper windows. In time this became an intolerable nuisance, and one chronicler mentions houses the third stories of which projected 15 feet. James 1, by proclamation, in 1619, ordered that it should be stopped, but the decree was not properly enforced.

If Winwall House, in England, be an Anglo-Norman edifice, its chimneys must have been built in the twelfth century, and those in the castles of Kenilworth and Conway must also precede in antiquity the *camini* and *fumajuoli* of Padua and Venice: [Beckman, Hist. Invent., II, 104.] Chaucer speaks, in several places, of chambers with "chimeneys"; Wickliffe refers to them in the preface of his translation of the New Testament in 1380, and Longlande a century later. But, often the "chimeney of the old writers meant an enormous fireplace, or recess, in the center of which the wooden logs burned on immense andirons; and even stone benches were placed on each side within. The smoke rose into a canopy or pyramid, and thence through an aperture into the air. There were also often used in the large, cold rooms, benches made with very high backs, and enclosed below the seat. These were drawn close around the "Ingle-side," to enclose the heat and keep off cold draughts. Henry IV erected a chimney-piece in the palace at Fontainbleau, 20 feet wide and 23 feet in hight, with lofty Corinthian columns, equestrian statues and other sculptures.

Although chimneys of some sort were doubtless in use as early as the ninth century, it does not appear that their invention was considered of much value, for Stoke castle, erected in the time of Richard II, had a large hall built without any chimney; the timbers of the roof still show the smoke stains from fires made on the hearth in the *center* of the room 400 years ago: [Britton, Arch. Antiq., IV, 144.] The farmers in Vale Royal, in their building and furniture, used (until about 1616) the old manner of the Saxons, having fire in the midst of the house, made against a clay hob, and their oxen also under the same roof: [Omerod, History of Chester, vol. 1, p. 103.] It might seem singular that an arrangement so simple and so necessary for comfort was very long in being discovered, and very slow of introduction; but the same can be said of window glass, which, though known to wealthy Romans as early as the beginning of this era, did not come into use for dwellings until about the middle of the seventeenth century.

Through the waste and wanton destruction of forests wood became scarce in Scotland and England about the year 1500, and there was no systematic planting of forest trees. Peat fuel was then used to considerable extent, but wood and charcoal were the most employed. About 1510 the trade in bituminous coal became of some consequence, and the houses of the coal districts, in the time of James IV and his predecessor, were often furnished with iron chimleys or grates, adapted to burn fossil coal from the Heuges of Souchie, in Clackmannshire. But, if they were neglectful of heating, the gentry of England and Scotland were careful about beds and bedding. These, with coverings, pillows and sheets, were often quite expensive, and were separately bequeathed by testament. The beds were often immense, both in hight and breadth, and the base, down to the floor, was made into a kind of strong box, or sets of drawers. The commonalty in hostelries often slept altogether on long platforms, covered with straw. On the night of the coronation of William and Mary, twenty-six butchers and their wives slept on a bed of this description, at the old inn, the Crown, at Ware.

Sir Thomas Boleyn, in a letter to Cardinal Wolsey, from Paris, March, 1519, describes the lodgings taken by the court at a village near Paris, on the sudden illness of the queen. "God knoweth full poorly lodged, but that the lodging is well dressed with goode stoffes. The great master hath no chimney in his chambre, but there is a great oven." About this time, in London, in the better houses, fires began to be made in several rooms. In 1524, in the house of "John Port, layt the kinge's servant," three rooms, beside the kitchen, had hearths, and there was an interesting display of fireside implements. In the hall were: "Item, a pair of andors and a pair of tongs, with a fyer-rake, with a lytell fyer choffell." In the parlor was "a pair of awdorns, cast of yrne," and a bedroom had "a pair of small andryons." Though coals and wood were still not very high in price in England, firing in general was scarce, and in country places the hearths were few. Even the right to use them was often bequeathed. In 1516, Richard Byrchett, of Pesemershe, says: "I will yt the sayd P'Nell my wyfe shall haue ye chamber she lyes in, and lyberte at ye fyer in the house; all yese thynges shal she haue, she ys wedo": [Nicholas, Tes. Vet., II, 785.]

Ennius Sylvius, who visited Scotland about the middle of the fifteenth century, relates that he saw the poor people in rags begging at the churches, and they received for alms a kind of black stone, with which they went away contented; and they burn it in place of wood, of which their country is destitute. Boetheus also mentions it as used by smiths and for smelting; but it is singular that neither he, Sylvius, nor Sir David Lyndsay, who also wrote at that date, have any name for coal. In Scotland kitchen fires have been kept up constantly for many years—in one case for 65 years, and when it did go out, "the wise people" noticed that the Laird's nephew died eleven months afterward.

We can gain some idea of what comforts King Henry VIII and his nobles had by quoting part of an ordinance made at Eltham in 1526: "For the better avoyding of corruption and all uncleannesse out of the king's house, * * the three master cookes of the kitchen shall have yearly twenty marks, to the intent that they shall provide such scoiyons as shall not go naked, or in garments of such vilenesse as they now do, nor lye in the nights and dayes in the kitchen or grounde by the fire side, * * which groomes so comen to the said chamber, shall not only avoid the pallets, but also make ready the fire, dress and strawe the chamber, purging and making clean the same of all manner of filthiness. * * * A yoman with a dagger is to searche the strawe of the King's bedde, that there be none untreuth therein; the bedde of down to be cast upon that": (Collection of ordinances, p. 151.)

As for the odors of the palace, they may be inferred from the foregoing, and Cardinal Wolsey is described as going forth in the morning, *en grande tenue*, holding an orange, the interior of which had been filled with a sponge dipped in vinegar and other perfumes, which, when he came near the "presses," or was pestered with many suitors, he would diligently apply to his nose. In fact, there, as on the continent, although great fires blazed in the royal chambers and halls, and the parlors of the wealthy, the domestics were almost perishing with cold. This discomfort did not proceed from selfish or stingy housekeeping, but rather from an affectation of hardihood, particularly among the lower classes, where effeminacy was reckoned a reproach. This may account, in part, for the slow introduction of chimneys. Walls were rarely lathed and plastered; ceilings were now just beginning to be boarded in the best houses; doors, sash, and window shutters were of the most wretched fit; and tongued floor boards did not come into use until 1670. About the same time, from Germany, came the grand invention of hanging, by a cord, weight, and pulleys, the lower sash of a window.

In 1658, Sir John Winter invented a fire box for burning coke or coal inside a chimney place, with a hole above, covered with a movable plate. This was similar to one suggested by Savot, in France, and was probably the origin of the first coal grate. An improvement was made on this by Jorevin de Rochford, in London, whereby greater economy was obtained, and the smoke better disposed of; but this was again exceeded by the one placed in his chamber by Prince Rupert, in 1768. In this, instead of a hole directly over the grate, the draught went out at the back, until the fire was well kindled, when a damper in the flue was pulled forward, which forced the smoke down a short distance, and then allowed it to rise in the chimney, behind a low partition in the middle of the flue.

The first of all our present coal stoves seems to have been one described by M. Justel to the Royal Society, as the invention of M. Dalesme, and which was exhibited at the fair of St. Germain, near Paris, in 1680. It was made of wrought iron, and consisted of a deep basin or vase seated on, and connected with a square box; and from the rear part of the latter a curved pipe rose into the chimney, at a hight considerably above the top of the vase. On starting the fire the iron pipe required to be first well heated, to make a downward draught through the coals. Justel is quite enthusiastic about it. Besides its ventilating a room, he says: "The most fœtid things, matters which stink abominably when taken out of the fire, in this engine make no ill scent; neither do red herrings broiled thereon." That was the *experimentum crucis* verily, and we don't wonder he liked the new "engine."

Glauber, who discovered the salt which bears his name, claims the discovery of the front cover or "blower" for a grate, leaving space below for the air to enter. This was a great triumph, and the vocation of the bellows was ended. He declared that so disgusted was he with the puffing at fires, and the smells and drudgery of his laboratory, that he was about to discard it forever, when he made this happy discovery; and he ends with a devout prayer of thanks to Heaven for the same: [Philosophical Furnace, p. 68.] We have been compelled to omit many very interesting facts, but enough have been given to impress us with the truth that, within only the past sixty years, a complete revolution has taken place, not alone in heating and ventilating buildings, but in all social and domestic habits. The whole system of home architecture has been changed; pure draughts of air, plenty of light, and wide streets, allowed, and even enforced by law; the ancient system of vassalage almost dead, and our inventive civilization so works that neither chimneys, nor any other good thing, shall ultimately be for the enjoyment of the rich alone.

* The only modern adaptation of the hypocaust we know of, is in the public library building of Cincinnati, Ohio—a new "fireproof" edifice. The main hall, 108 feet long by 80 wide, and 50 feet in hight, is warmed (or said to be) by heating the marble floor to about 80° F., by means of steam pipes laid in large arched flues below. It is claimed that the lower stratum of air is sufficiently and very economically heated in the coldest weather, and also without inconvenience to the feet, while the upper strata of air remain comparatively cool (no doubt of that), which is essential for the preservation of the books.

On the Amount of Power Consumed in Rolling Sheet Iron.

In order to ascertain the amount of power required for rolling iron, it is necessary to set out with the power furnished by the engine, and that communicated by the fly-wheel to the rolls. It is easy to ascertain the power furnished by the engine, except what is consumed within the machine by friction. The live force communicated by the fly-wheel is calculated from the formula $L=J\frac{W^2}{2}$; in which J is the moment of inertia of the whole wheel, W is the angular velocity at the distance $r=1$ meter. An exact determination of the velocity is of great importance, since the second power of W is used in the formula.

Rupert Boeck has invented the following method of accomplishing it. A sort of finger was attached to the fly-wheel in such a way as to press for an instant on the key of a telegraph and close the current. By connecting the wire with a Morse register, a point was made on the paper at every revolution of the wheel. A series of points were thus produced, the distance of which from one another could be used to determine the velocity of a single revolution. Before beginning the experiment, the length of paper unrolled per second was measured, and found to be, in that case, 20·25 mm.

In this way experiments were made in a rolling mill at Donawitz, near Leoben, with an engine whose cylinders were 0·948 meter (about 3 ft.) in diameter, and with a stroke of 1·712 meter. It was provided with Meyer's valve gearing, the eccentric of which was worked by a crank. The engine was built for a 300 horse-power, and should run with 60 or 70 revolutions. The balance wheel has a diameter of 7·586 meters (24 ft. 10 in.), and is calculated to weigh 29·62 kilos. The moment of inertia, J, of the balance wheel was calculated from the carefully ascertained dimensions and found thus:

Moments of inertia of circumference	23996·58
" " for 8 spokes	1289·51
" " " nave	223·59
	J=25509·68

The total moments of inertia in round numbers was J = 25510.

A series of experiments were made by running the machine empty, from which it was found that the average effective pressure of the piston was 2235·78 kilos. per square meter, and with 48 revolutions this was equal to 56·5 horse-power of work. This represented the total power required to run the engine and rolls when empty, as the rolling work could not be detached. The friction of the fly-wheel on its journal alone consumed 16·8 horse-power, if the coefficient of friction be taken at 0·05. The remaining loss of power by the resistance of friction in the engine and in the boxes of the rolls is 59·5—16·8 = 39·7 horse-power.

On the day on which these observations were made, a plate of boiler iron was rolled which had the following dimensions when trimmed: Length, 15 feet; width, 41 inches; thickness, 6 lines. The rolls were 0·71 meter in diameter. The dimensions of the plate after passing through the rolls 10 times were the following:

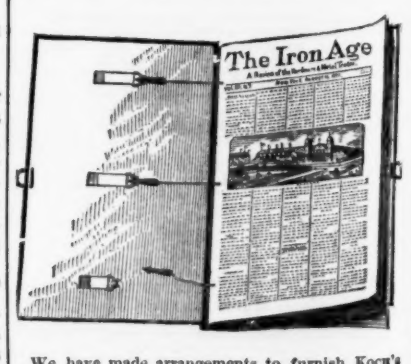
After the	Thickness (lines.)	Length (in.)	Width (in.)	Revolutions of the rolls.
10th through.	16·5	84	44	0·99
11 "	14·5	92	..	1·08
12 "	12·5	101	..	1·19
13 "	11·0	107	..	1·26
14 "	9·5	130	..	1·53
15 "	9·0	144	..	1·69
16 "	8·0	159	..	1·89
17 "	7·0	175	..	2·06
18 "	6·5	191	..	2·25
19 "	6·2	204	..	2·40
20 "	6·0	230	45	2·71

No. of passages through rollers.	Time of a revolution.	Angular velocity—W.	Life force of fly-wheel in horse-power.	Total work given by fly-wheel.	Work given by fly-wheel reduced to seconds of rolling time.	Pure active effect of motor in horse-power.	Total effect per second of horse-power applied to the rolling.
10	1·10	5·69	5501	116	107·5	69·4	176·9
	1·10	5·69	5501				
	1·11	5·63	5385				
11	1·08	5·78	5678	177	152·2	69·4	221·6
	1·09	5·74	5599				
	1·10	5·69	5501				
12	1·09	5·74	5599	214	164·6	73·9	238·5
	1·10	5·69	5501				
	1·11	5·63	5385				
13	1·08	5·78	5678	177	129·9	73·9	203·8
	1·10	5·69	5501				
	1·09	5·74	5599				
14	1·11	5·63	5385	214	125·8	73·9	199·7
	1·11	5·63	5385				
	1·18	5·30	4773				
15	1·20	5·21	4613	387	187·8	73·9	261·7
	1·25	5·08	4386				
	1·20	5·21	4613				
16	1·21	5·17	4542	363	256·	96·4	252·4
	1·25	5·00	4250				
	1·28	4·88	4046				
17	1·30	4·81	3990	514	188·2	96·4	284·6
	1·34	4·67	3706				
	1·37	4·56	3532				
	1·28	4·88	4046				
18	1·32	4·74	3818	650	212·4	96·4	308·8
	1·38	4·53	3488				
	1·40	4·47	3396				
	1·31	4·77	3895				
19	1·38	4·53	3488	755	223·3	96·4	319·7
	1·41	4·43	3335				
	1·46	4·28	3110				
	1·39	4·50	3440				
20	1·46	4·28	3110	816	195·6	123·6	319·2
	1·58	3·96	2665				
	1·59	3·93	2634				

The results of the first nine passages through the rolls are omitted in the above table because the inaccuracies of the whole experiment are felt there the most. This much was, however, learned, that the wheel was most active at that moment when the fresh packet went through the rolls for the first time, and the total work absorbed by the starting jar seemed to be from 400 to 500 horse-power.

Get Binders

FOR THE IRON AGE.



We have made arrangements to furnish Kocn's PATENT BINDER, which we think altogether the best before the public, to our subscribers at the following very low rates—about the wholesale prices by the dozen.

Half Cloth.....$1·00 each.
(Cloth Back and Corners, with Morocco Paper Sides—a good, serviceable Binder.)

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Half Morocco..... 2·00 "
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The above are all in black, which is the most serviceable color, with the exception of the Half Morocco, which are put up in a number of handsome shades. The name of the paper is stamped in gold on either side, and each Binder is furnished with loops by which it can be hung up against the wall as newspaper files are usually disposed of.

The Binders will each hold the twenty-six numbers in the form of a bound volume. They can be nicely inserted in two or three minutes by any boy of ordinary intelligence; and when the covers are full they can be either preserved in that shape as bound volumes of *The Iron Age*, or they can be emptied and used again. There is no possibility of their getting out of order, unless the cords, which are very strong, wear out, when anyone can easily replace them with a piece of fishing line or other suitable string. Subscribers who value the paper should order them at once, so as to keep the paper in good order

On receipt of the price we will ship them, safely put up, by any express line or to any New York hotel to be packed. They are too large to be sent by mail.

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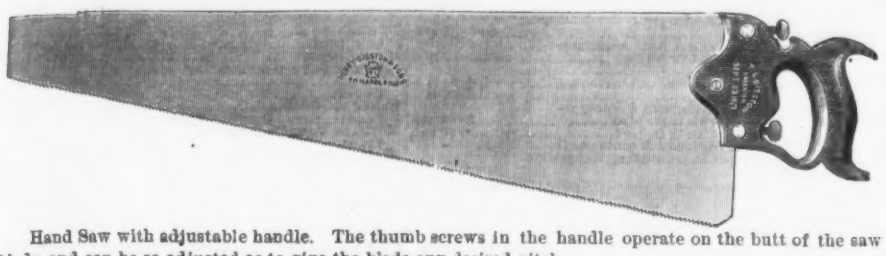
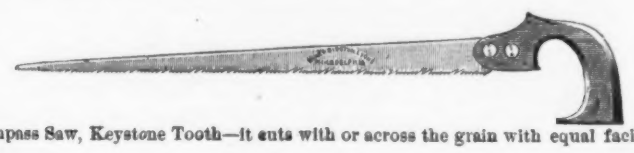
Manufacturers of SHEET STEEL, and all Articles made from Sheet Steel.

SAWS OF EVERY DESCRIPTION.

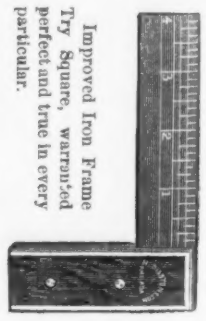
Also, FILES, TOOLS, Etc., and all kinds of Labor Saving Implements for keeping Saws in perfect order.



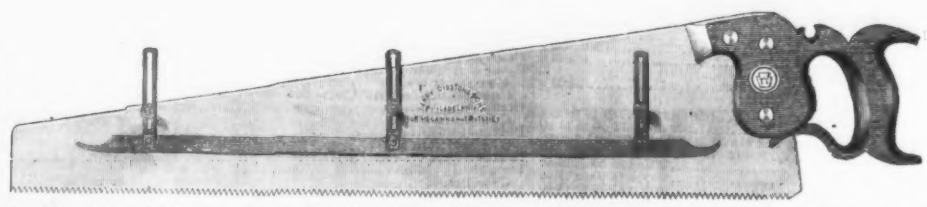
Hand Saw with adjustable handle. The thumb screws in the handle operate on the butt of the saw blade, and can be so adjusted as to give the blade any desired pitch.



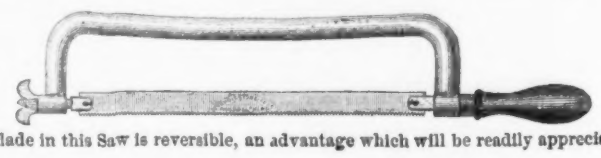
Compass Saw, Keystone Tooth—it cuts with or across the grain with equal facility.



Improved Iron Frame Try Square, warranted perfect and true in every particular.



Patent adjustable Gauge Saw for sawing tenons, kerfing, or any work where the cut is required to be of definite depth. Will pay for itself in one day. Try it and be convinced. Remove the gauge and use as an ordinary saw.



Hack Saw. The blade in this Saw is reversible, an advantage which will be readily appreciated by mechanics.

READ, MARK, LEARN.

We guarantee our Cross-Cut Saws to do more work, day in and day out, the season through, than any other saw in the market.

The test of practical experience has been ap-

plied, the verdict given, the fiat has gone forth, and the Humbugs are fast fizzling out, while our rapidly increasing sales testify to the esti-

mation in which these saws are held.

We pledge ourselves that no effort shall be wanting to keep up the standard and reputation of our manufactures.

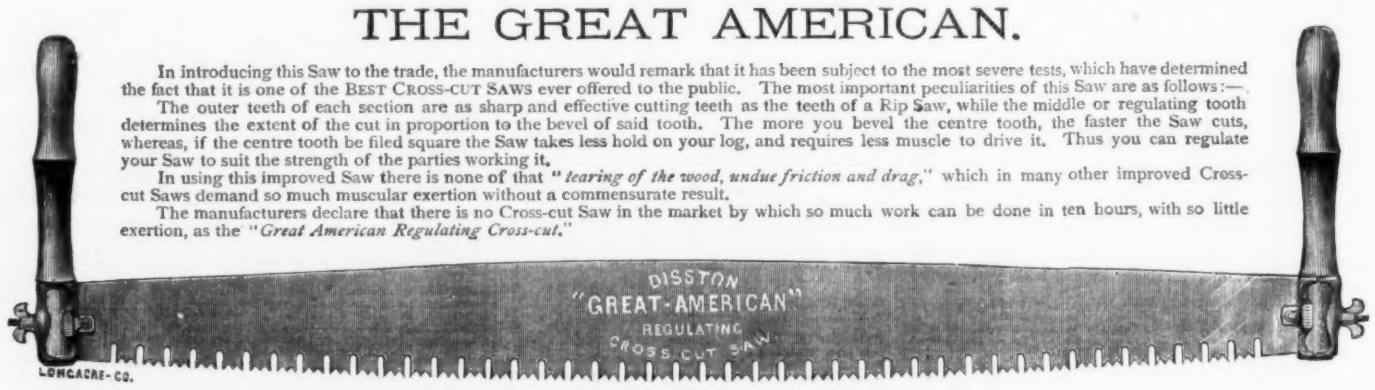
THE GREAT AMERICAN.

In introducing this Saw to the trade, the manufacturers would remark that it has been subject to the most severe tests, which have determined the fact that it is one of the BEST CROSS-CUT SAWS ever offered to the public. The most important peculiarities of this Saw are as follows:—

The outer teeth of each section are as sharp and effective cutting teeth as the teeth of a Rip Saw, while the middle or regulating tooth determines the extent of the cut in proportion to the bevel of said tooth. The more you bevel the centre tooth, the faster the Saw cuts, whereas, if the centre tooth be filed square the Saw takes less hold on your log, and requires less muscle to drive it. Thus you can regulate your Saw to suit the strength of the parties working it.

In using this improved Saw there is none of that "*tearing of the wood, undue friction and drag*," which in many other improved Cross-cut Saws demand so much muscular exertion without a commensurate result.

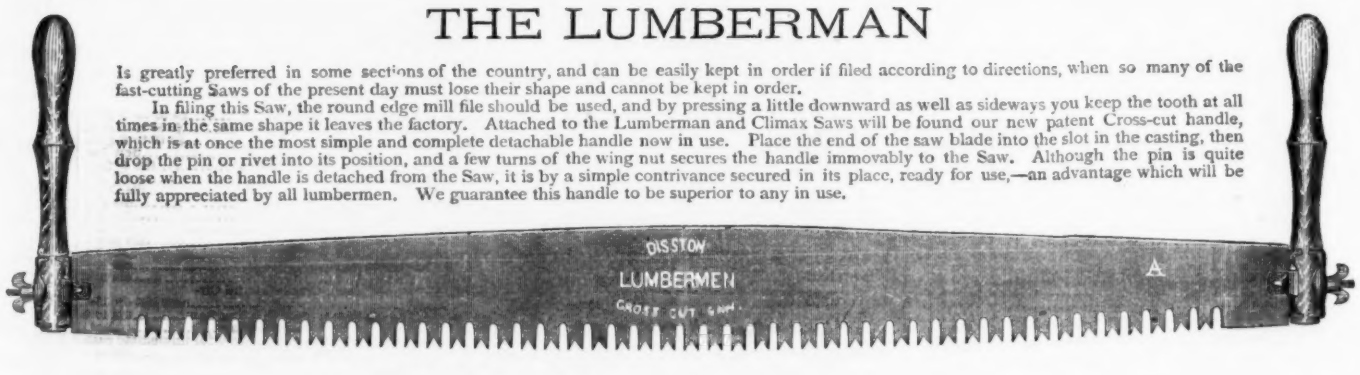
The manufacturers declare that there is no Cross-cut Saw in the market by which so much work can be done in ten hours, with so little exertion, as the "*Great American Regulating Cross-cut.*"



THE LUMBERMAN

Is greatly preferred in some sections of the country, and can be easily kept in order if filed according to directions, when so many of the fast-cutting Saws of the present day must lose their shape and cannot be kept in order.

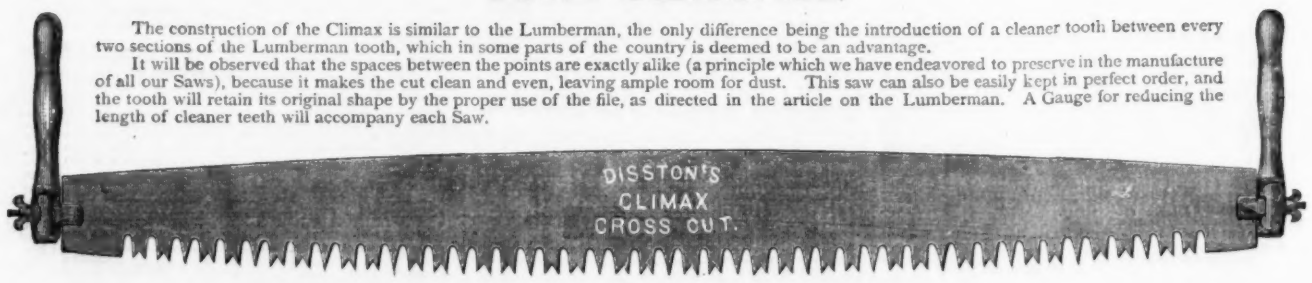
In filing this Saw, the round edge mill file should be used, and by pressing a little downward as well as sideways you keep the tooth at all times in the same shape it leaves the factory. Attached to the Lumberman and Climax Saws will be found our new patent Cross-cut handle, which is at once the most simple and complete detachable handle now in use. Place the end of the saw blade into the slot in the casting, then drop the pin or rivet into its position, and a few turns of the wing nut secures the handle immovably to the Saw. Although the pin is quite loose when the handle is detached from the Saw, it is by a simple contrivance secured in its place, ready for use,—an advantage which will be fully appreciated by all lumbermen. We guarantee this handle to be superior to any in use.



THE CLIMAX.

The construction of the Climax is similar to the Lumberman, the only difference being the introduction of a cleaner tooth between every two sections of the Lumberman tooth, which in some parts of the country is deemed to be an advantage.

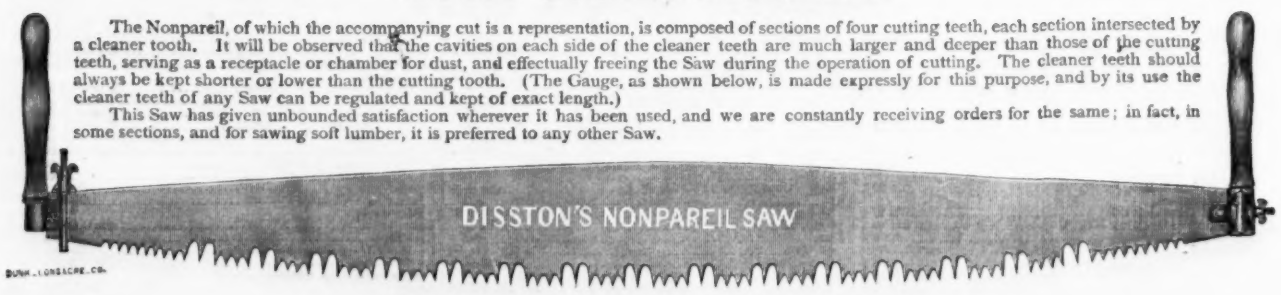
It will be observed that the spaces between the points are exactly alike (a principle which we have endeavored to preserve in the manufacture of all our Saws), because it makes the cut clean and even, leaving ample room for dust. This saw can also be easily kept in perfect order, and the tooth will retain its original shape by the proper use of the file, as directed in the article on the Lumberman. A Gauge for reducing the length of cleaner teeth will accompany each Saw.



THE NONPAREIL.

The Nonpareil, of which the accompanying cut is a representation, is composed of sections of four cutting teeth, each section intersected by a cleaner tooth. It will be observed that the cavities on each side of the cleaner teeth are much larger and deeper than those of the cutting teeth, serving as a receptacle or chamber for dust, and effectually freeing the Saw during the operation of cutting. The cleaner teeth should always be kept shorter or lower than the cutting tooth. (The Gauge, as shown below, is made expressly for this purpose, and by its use the cleaner teeth of any Saw can be regulated and kept of exact length.)

This Saw has given unbounded satisfaction wherever it has been used, and we are constantly receiving orders for the same; in fact, in some sections, and for sawing soft lumber, it is preferred to any other Saw.



Plain Truths for Practical Men.

We guarantee our Cross-Cut Saws to do more work, day in and day out, the season through, than any other saw in the market.

The test of practical experience has been ap-

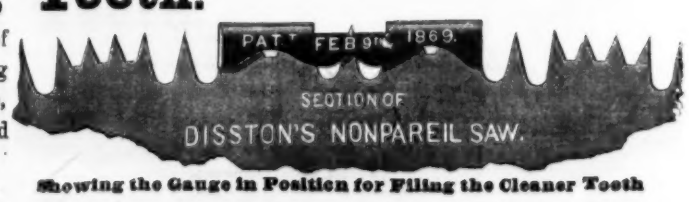
plied, the verdict given, the fiat has gone forth, and the Humbugs are fast fizzling out, while our rapidly increasing sales testify to the es-

timation in which these saws are held.

We pledge ourselves that no effort shall be wanting to keep up the standard and reputation of our manufactures.

Gauge for Regulating Cleaning Teeth.

The cleaning teeth of all saws should be somewhat shorter than the cutting teeth, and, although shortened, they should be of uniform length throughout. The inner edge of the Gauge rests on the points of the cutting teeth, the cleaning teeth projecting through the opening in centre of Gauge. Reduce the projecting points, by means of a file, until arrested by the edges of the Gauge, which is made of hardened steel. Thus tooth after tooth can be rapidly and correctly reduced to an even length by any unskilled operator



Showing the Gauge in Position for Filing the Cleaner Tooth

New York Wholesale Prices, July 22, 1874.

HARDWARE.

Anvils.
Solid Cast Steel.....₩ ℔ 14c
Wright's.....₩ ℔ gold 12c; over 250 ℔s 12½c, gold
Armitage's Mouse Hole.....gold 11c
Wilkinson's.....₩ ℔ gold 11½c
Eagle Anv. s, ₩ ℔ 11c currency.....dis 15&10 %

Apple Parers.
Turn Table.....
Lightning.....
Hudson's.....
Reading.....$8·50 ₩ doz
Union.....
Skeleton Paring, Coring and Slicing.....
Bay state, Paring, Coring and Slicing.....$15 00 dis 5 %
Climax Slicer.....9 00 dis 5 %
Bay State Peach Parer.....$11 00 @ 11 50
Lightning " " .....11 00 @ 11 50
Peach Stoner and Halver.....7 00

Augers and Bits.
Snell Mfg. Co.....dis 15 @ 20 %
Russell Jennings.....dis 10 %
Douglass Mfg. Co., Extra.....
" " No. 1.....
" " Hollow Augers.....
Cushman's Expanding Hollow Augers.....dis 20 %
Ives' Augers and Bits.....dis 30&10 %
" Gouge Lip Augers and Bits.....dis 30&10 %
" Hollow Augers.....dis 30&10 %
" Expansive Hollow Augers.....dis 30&10 %
" Expansive Bits.....dis 20&10 %
Andrews' Bits.....dis 25 %
Clark's Expansive Bits.....dis 15 %
Cook's Patent Augers.....dis 50 %
" " Bits.....dis 40&10 %
Shepardson's Double Cut Bits.....dis 20 %
Griswold's Patent.....dis 20 %
Cast steel Cut Augers.....dis 30&10 %
" Auger Bits.....dis 30&10 %
Gimlet Bits.....dis 10&10 %
Long Augers.....new list dis 30 %
Bonney's Patent Hollow.....$48 per doz—dis 25 %
Stearns' " " .....$48 per doz—dis 25 %
Morse's Bit Stock Drills.....dis 20 %
Nobles Mfg. Co. C. S. Cut Augers.....dis 30&10 %
Watrous Snap Augers.....dis 15 %
Vaughan's Post Hole—
6 in. $28 60; 9 in. $25 per doz.....dis 30 %

Axes.
Brook's.....per doz $12 00 @ 14 00 net
Blood's.....per doz $12 50 @ 14 00
Hunt's.....₩ doz $14 00 @ 19 00 dis 5&5&5 % cash
Collins'.....₩ doz 11 00 @ 15 50 net @ dis 5 %
Hurd's.....₩ doz 12 50 @ 13 50
Schweitzer Mfg. Co.'s.....₩ doz 13 00 @ 15 00
Simmons'.....₩ doz 12 50 @ 14 00
Morris'.....₩ doz 12 50 @ 13 50
Red Jacket.....₩ doz 12 00 @ 12 50
Mann's.....₩ doz 12 50 @ 13 00
Double Bitted.....₩ doz 21 50 @ 22 00
Lowell Tool Co., "Peerless".....₩ doz 13 00 @ 14 50
Underhill's.....₩ doz 12 00 @ 13 00
" Crown.....₩ doz 12 50 @ 13 50
John Leverett's.....₩ doz 12 50 @ 13 00
Nobles Mfg. Co. S. B.....₩ doz 12 50 @ 13 00
" D. B.....₩ doz 22 00 @ 23 00

Balances.
Chatillon's } new list dis 15 %
Frary's }
Morton's }

Bands.
Plated.....new list dis 50&5 %
Iron Rim.....new list dis 25&5 %
Brass (Plated list).....new list dis 50, 10&5 %
Oroide.....new list dis 50&5 %

Bells.
Hand, Light Brass.....dis 60&10 @ 65&10 %
White Metal.....dis 50&10 %
Sleigh.....dis 50 %
Store.....dis 15&10 %
Abbe's.....dis 10&10 %
Taylor's Patent Door.....net
Western Gong.....net
Brook's Cranks.....revised list dis 50 %
" Pull.....revised list dis 50 %
Hart Mfg. Co., Crank and Pull.....dis 50&10 %
Cow—Common Wrought.....dis 20&10 %
" Western.....new list dis 20&10 %
" Kentucky "Star".....new list dis 20&10 %
" Dodge's Genuine Kentucky.....new list dis 25 %
" Yaw's Genuine.....dis 20 %
" Texas.....dis 33 %
Call.....dis 15 %

Bellows.
Blacksmiths'.....dis 20 %
Moulders'.....dis 15 %
Hand Bellows.....dis 10 %

Blind Fasteners.
Van Sand's.....₩ gross $14 00
Washburn's Patent.....₩ gross 14 00
Merriman's.....
Blind Staples.
Boardman's Patent, ¼ in. and larger.....₩ ℔ 37 c
" ⅜ in. " " 42 c

Bolts.
Carriage and Tire, Ætna Nut Co.....dis 60 %
Stove, Ætna Nut Co.....dis 10&5 %
Cast iron Barrel, Shutter, &c.....new list dis 60&10 %
Wrought Iron Barrel.....new list dis 50&10 %
" " Square.....new list dis 50&10 %
Wrought Iron Flush.....dis 15 %
Carriage and Tire, Common.....dis 70&10&5 %
" " " Norway Iron.....50&10 %
Star, Philadelphia.....dis 50 @ 50&10 %
Eagle, Philadelphia.....dis 50 @ 50&10 %
Philadelphia Pattern, P. S. & W.....dis 50&10 %
Tire, Bessemer Steel, Hubbard & Curtiss.....dis 50 %
Carriage and Tire, R. B. & W.....old list dis 50&5 %
Plow, R. B. & W.....dis 30 %
Stove, R. B. & W.....dis 10 %
" Shelton Co. Shaved Heads.....dis 15 %
Union Nut Co., old list.....dis 50&2½ %
" " Stove.....dis 15 %
Machine.....dis 30&10 @ 40 %
Borax.—in cases of 100 lbs.....₩ ℔ 16c
Boring Machines.
Kellogg's.....dis 15 %
Snell Mfg. Co., Rice's Patent.....dis 15 %
" " " Regular.....dis 15 %
Douglas Mfg. Co.....dis 20 %
Mortising Machines each.....$18 00
Bow Pins......dis 50 %
Braces.
Barber's Patent.....dis 40&5 %
Q. S. Backus.....dis 40&10 %
Wilson Mfg. Co.....new list dis 10 %
Spofford's Patent.....dis 40&5 %
Noble's Patent.....dis 40&5 %
Bartholomew's American Ball.....dis 10&10 %
" Patent Grip.....dis 40 %
Ives' Novelty.....dis 40&5 %
Bull Rings......dis 50&10 %
Bung Hole Borers.
Common and Ring.....dis 25 %
Enterprise Mfg. Co.....dis 20 %
Ives' Tap Borers.....dis 25 %
Butchers' Cleavers.
Humason & Beckley Mfg. Co.....dis 20&10 %
Bradley's.....dis 25 %
Beatty's.....new list dis 10 %

2	3	4	5	6	7	8	9
$19·00	$21·50	$24·00	$27·00	$30·00	$33·50	$36·50	$40·00

Hart Mfg. Co.....dis 45&10 %

0	1	2	3	4	5	6
$25·25	$29·75	$30·25	$38·75	$42·25	$48·50	$54·00

Butts.
Wrought Brass.....new list dis 30 %
Cast Fast Joint, Narrow.....dis 50&5 %
" " Broad.....dis 50&5 %
Cast Loose Joint.....dis 60&5 %
" " Mayer.....dis 50&5 %
" " Parliament.....dis 50&5 %
Drilled Wire Jointed—
Narrow.....dis 55&10 %
Broad.....dis 50 %
Loose Joint.....dis 60 %
Mayer's.....dis 50 %
Parliament.....dis 50 %
Loose Pin.....dis 5 %
Wrought Fast Joint, Narrow.....dis 30 %
Wrought Broad.....dis 35 %
" Loose Joint.....dis 35 %
Wrought Table and Back Flaps.....dis 3 %
Palmer Blind Butts.....dis 30&10 %
Nicholson Blind Butts.....dis 40&10 %
Parker's Blind Butts.....dis 50 %
Hunter's Blind Butts.....dis 30&10 %
A. S. Parker's.....dis 40&10 %
Clark's Surface Blind Hinges, Nos. 1, 3 and 5.....dis 50&5 %
" " " No. 20.....dis 55&10 %
" Mortise " No. 2, 4, 4½, 6, 8, 10.....dis 35 %
Seymour's.....dis 40&10 %
Shepard's.....dis 50&5 %
Garretson's.....No. 1, dis 5&10 %; Nos. 2 and 7, dis 50 %
The American Spiral Spring Butt Co.....dis 30 %
Standard.....dis 5&5 %
Caps—Percussion, per 1000.
G. D.....38c
Ely's E. B.....1-4s, 53c.; 1-10s, 65c., gold
" Double Waterproof, 1-4s, $1·45; 1-10s, $1·52½c., gold
" Colt's.....1-10s 70c., gold
Cartridges.
Metallic.....dis 50 @ 50&10 %
Cards.—Horse and Curry.....dis 25&10 %
Cotton.....new list dis 10&10 %
Wool.....new list dis 10&10 %
Carpet Stretchers.
P. S. & W.....per doz $2 00; dis 33⅓ %
Cattle Leaders......dis 50&10 %
Chain
English Coil, by the cask.....net gold
₩ ℔.....13 9½ 9 8½ 8¼ 8c
8-16 ¼ 5-16 ⅜ 7-16 ½
Trace, 6½-10-2.....by the cask, ₩ pair, gold, 60c
Trace, 7-10-2.....by the cask, ₩ pair gold, 65c
Galvanized Pump Chain.....₩ ℔ 14c
German Halter Chain.....new list, Jan. 1, dis 10 %
German Coil.....new list, Jan. 1, dis 10 %
Jack Chain, Iron.....dis 50 %
" Brass.....dis 40 %
Chalk.
White.....₩ gross, 50c
Red.....₩ gross, 75c
Blue.....₩ gross, 90c
Crayons.....₩ gross, 14c
Cherry Stoners.
Family.....₩ doz $4·50

Chisels.
Socket Firmers.....dis 60&10 %
Socket Framing.....dis 60&10 %
Socket Corner.....dis 60&10 %
Tanged Firmers.....dis 40 to 40&10 %
Butcher's.....$6·50 to £ gold—new list
Newbould's.....$5·50 to £ gold
Spear & Jackson's.....$5·50 to £ gold—new list
Clamps.
Judd's.....dis 45&10 %
Lambert's.....dis 20 %
Providence Tool Co.....dis 10 %
Clips, Axle.
Norway or Best.....dis 30 %
Superior.....dis 50 %
"Star," Superior Philadelphia.....dis 45&3 %
Coal Shovels.
Iron Handled.....₩ doz, $ 85 @ 1 25
Wooden Handled.....₩ doz, 1 00 @ 2 00
Coal Hods.—Smith, Burns & Co.....dis 15 @ 25 %

	14	15	16	17	18	Incn.
Japanned	$6·00	6·25	6·75	7·50	8·00	per doz.
Galvanized	9·50	10·00	10·75	11·50	12·50	"

Morning Glory Funnel Hods—

	No. 15	16	17	
Japanned	$9·00	10·50	12·00	per doz
Galvanized	13·00	14·50	16·00	"

Cockeyes.....dis 30 %
Cocks.
Brass Racking.....dis 25 %
Lock and Globe.....dis 25 %
Coffee Mills.
Board and Box.....dis 15 %
Increase Wilson's.....new list dis 15 %
Selsor's Pat.....$9·50, $10·50—dis 25 %
French Steel.....dis 15 %
The Swift.....dis 25 %
"American".....dis 20 %
Enterprise Mfg. Co.....dis 20 %
Diamond, per doz $4 00.....dis 10 %
Compasses and Dividers.
Bemis.....dis 35 %
Cook's.....dis 15 %
Excelsior.....dis 30 %
Peck Stow & Wilcox.....dis 25 %
Coopers' Tools.
Bradley's.....dis 15 @ 20 %
Chas. E. Little.....dis 20 @ 25 %
Swan & Brombacher.....dis 15 @ 20 %
Corkscrews.....dis 25 %
Corn Knives and Cutters.
Bradley's.....dis 10 %
Croquet.
Phineas Smith.....dis 40&10
Crow Bars.
Cast Steel.....₩ ℔ 11c. net
Iron, steel points.....₩ ℔ 6½c
Crucibles.
Gautier & Co.....₩ No. 8½c
Curry Combs.
Hotchkiss' and Kellogg's, Iron and Brass.....dis 20 %
Fitch's.....dis 15&10 %
Rubber.....₩ doz, $9·00—dis 15 %
Schweitzer Mfg. Co.....dis 30 %
Curtain Pins.
Silvered Glass.....old list dis 45&10 %
Cutlery.
American Table.....net list
American Pocket.....dis 25 %
Am. Pocket—Humason & Beckley Mfg. Co.....dis 20&10 %
Dog Collars.
Embossed Gilt.....dis 15 %
Leather.....dis 30 %
Door Springs.
Gray's.....$7·50 per doz—dis 40&10 %
Torrey's Patent.....$7·50 ₩ doz—dis 40&10 %
Palmer's Japanned No. 6.....₩ doz $5·00
" Copp ered " .....6·00
" Silvered " " .....8·00
Challenge.—
Japanned.....₩ doz $4 00 @ 6 00
Bronzed.....₩ doz 5 00 @ 7 00
Nickel Plated.....₩ doz 6 50 @ 9 00
1 Gross lots.....dis 10 %
5 Gross lots.....dis 20 %
Drawing Knives.....dis 60 @ 60&10 %
Bradley's.....dis 25 %
Adjustable Handled.....dis 10 %
Drills.
Ingersoll's Ratchet.....dis 25 %
Moore's Triple Acting Ratchet.....dis 20 %
Whitney's Ratchet.....dis 20 %
Blacksmiths'.....each $3 25 net
Drill Chucks.
The Danbury.....each 10·00—dis 25 @ 30 %
Drug Mills.
American Drug Mills.....dis 20 %
Egg Beaters.
Monroe's.....₩ doz net $8·25 @ 8·50
Dover.....₩ doz net $6·00
National.....₩ doz $4·50—dis 10 %
Peerless.....₩ doz $4·00—dis 10 %
Emery.
Genuine Chester—Regular Nos.....₩ ℔ 7c } dis 5 @ 10 %
" " Flour and FF.....₩ ℔ 4c }
Washington Mills—Regular Nos.....₩ ℔ 8c
" " Flour.....₩ ℔ 8c
Enameled and Tinned Ware.
Kettles.....dis 20 @ 25 %
Sauce Pans, Glue Pots, &c.....dis 15 %
Escutcheons.
Brass Thread.....dis 60&10 %
Wood.....dis 25 %
Faucets.
Cork Lined, Wood.....dis 60 %
Fenn's.....dis 50 %
" Cork Stops.....dis 40 %
Star.....dis 55&10 %
Frary's Patent Petroleum.....dis 10&10 %
Taylor's Pattern " .....dis 20&10 %
Wood and Metallic.....dis 40 %
Felloe Plates.....₩ ℔ 14c; dis 10 %
Files.
Nicholson.....$5 00 to £ currency—dis 10 %
Newbould's.....5 25 to £ gold
J. & Riley Carr's.....5 50 to £ gold
" " Rasps.....5 75 to £ gold
Stubs'.....8 50 @ 9 00 to £ gold
Butcher's.....5 50 to £ gold
Walter Spencer & Co.'s "Diamond".....5 25 to £ gold
Spear & Jackson's.....5 00 to £ gold
Hargreaves, Smith & Co.'s.....5 00 to £ gold
Jowitt's.....5 25 to £ gold
"Western".....net 5 00 to £ gold
W. K. & C. Peace's "Imperial".....4 75 to £ gold
R. Ibbotson.....5 00 to £ gold
Beam & Mur say, "Cyclops".....4 85 to £ gold
Fisher's.....4 75 to £ gold
Goodlad's.....4 00 to £ gold
Moss & Gamble.....$ 25 @ 5 50 to £ gold
Thos. Turner & Co. (Peter A. Frasse & Co.).....5 00 to £ gold
" " Horse Rasps.....5 50 to £ gold
"Philo Sheffield," P. T. Co.....5 00 to £ gold
Floral Tools.....dis 25 %
Fluting Machines.
Mrs. Coles, 7 inch rolls.....6 50
" " 5 " " 5 50
Knox, with 4-inch Rolls.....5 00 each dis 10 %
" " 6 " " .....6 00 each dis 10 %
O. K.....6 50 each net
Peerless, 4-inch Rolls.....4 00 each net
" 5 " " .....5 00 each net
Excelsior, No. 1.....4 75 each net
" No. 2.....6 50 each net
Diamond.....7 50 each net
Climax 7-inch Rolls.....8 00 each net
" 4½ " .....6 50 each net
Empire.....4 00 each net
Eureka, No. 1, 7-inch Roll.....8 00 each net
" No. 2, 5-inch Roll.....6 00 each net
K. F. M., 4½-inch Roll.....5 50 each net
" 8-inch Roll.....6 00 each net
Myers' Fashion Fluter, 4½-inch Rolls.....3 00 each net
" Convex Brass Fluter, Sad Iron attachment..$1·75
Domestic Fluter.....$1·75 each net
Fairy, Self-Heater.....8 00 each net
Geneva Hand Fluter.....$15 00 per doz net
Champion, 6 inch rolls.....$6 00 each dis 10 %
" 4 inch rolls.....$5 00 each dis 10 %
Forges.
Keystone Portable Forge Co.'s.....dis 20 %
"Empire" (W. P. Kellogg & Co.).....dis 20 %
Forks.
Hay, Manure & Spading.....dis 30 %
Plated A 1.....dis 40&5 @ 50&5 %
Freezers.
Champion.....dis 33⅓
Torrey's.....dis 50 %
Fry Pans.—P. S. & W.
Tinned.....dis 25 %

	3	3½	4	4½	5	5½	6	6½	7	7½
₩ doz	$3·00	3·25	3·63	4·00	4·50	5·00	5·50	6·00	7·00	
No.	0	1	2	3	4	5	6	7	8	
Smith, Burns & Co., "Excelsior" Polished										dis 35 %
₩ doz	$3·70	4·00	4·70	5·30	6·00	7·00	8·00	9·00		
No.		1	2	3		5	6	7	8	

Gas Stoves.
Tifft & Howard.....dis 20 %
Gauges.
Marking.....dis 45&10 %
Wire.....dis 10 %
Grind Stones.
J. F. Green & Bro.....dis 20 %
Hammers.
Emmet Hammer Co.....dis 10 %
Humason & Beckley Mfg. Co.....dis 20&10 %
Maydole's, new list.....dis 5 %
Cheney's.....new list net
Verree.....dis 5 %
Yerics & Plumb.....new advanced list dis 10 %
Minot & Co.....dis 10 %
Magnetic Tack.....dis 2&10 %
Handles.
Hammer and Hatchet.....dis 10 %
Quakertown, Axe, Pick and Sledge.....dis 10 %
" Hammer and Hatchet.....net
Greensboro', Axe, Pick, Hammer, &c.....dis 10 %
Woolworth Axe, Pick and Sledge.....dis 10 %
Brad Awl.....per gross $3 50—dis 2&10 %
Hickory Firmer Chisel, ass'td " 5 25—dis 10&10 %
" " " large " 6 25—dis 10&10 %
Apple " " ass'td " 6 00—dis 10&10 %
" " " large " 7 00—dis 10&10 %
Socket " " ass'td " 3 50—dis 10&10 %
" Framing " " " 6 00—dis 10&10 %
File....." " " 3 50—dis 10&10 %
Auger....." " " 5 50—dis 10&10 %
" large " 6 50—dis 10&10 %
Hangers.
Barn Door.....revised list dis 60&10 %
"Anti-Friction" (Rider, Wooster & Co.).....dis 30 %
Novelty.....dis 30 %

Harness Snaps.
Henshaw's.....dis 25&10 %
Judd's.....dis 40 %
Fitch's.....dis 30 %
Hotchkiss'.....dis 10 %
Andrews'.....dis 25 %
Sargent's.....new list dis 50&10 %
Hatchets.—Isaiah Blood.....dis 10 %
Shingling, Nos. 1 2 3.....₩ doz $7 50 8 00 8 50
Claw, " 1 2 3.....₩ doz 8 50 9 00 9 50
Lathing, " 1 2 3.....₩ doz 7 50 8 00 8 50
Hunt's.....dis 10 %
Shingling, Nos. 1 2 3.....₩ doz $7 25 8 00 8 75
Claw, " 1 2 3.....₩ doz 7 75 8 50 9 25
Lathing, " 1 2 3.....₩ doz 7 50 8 25 9 00
Hurd's.....dis 20 %
Shingling, Nos. 1 2 3.....₩ doz $8 00 8 50 9 00
Claw, " 1 2 3.....₩ doz 9 00 9 50 10 00
Lathing, " 1 2 3.....₩ doz 8 00 8 50 9 00
Newark's Edge Tool Co.'s.....dis 25 %
Shingling, Nos. 1 2 3.....₩ doz $6 50 7 00 7 50
Claw, " 1 2 3.....₩ doz 7 25 7 75 8 25
Lathing, " 1 2 3.....₩ doz 6 50 7 00 7 50
Yerks & Plumb.....dis 10 %
Shingling, Nos. 1 2 3.....₩ doz $7 00 7 50 8 00
Claw, " 1 2 3.....₩ doz 7 50 8 00 8 50
Lathing, " 1 2 3.....₩ doz 7 00 7 50 8 00
Simmon's.....dis 15 %
Shingling, Nos. 0 1 2 3.....₩ doz $7 50 8 00 8 50 9 00
Claw, " 1 2 3.....₩ doz 9 00 9 50 10 00
Lathing, " 1 2 3.....₩ doz 8 00 8 50 9 00
J. P. Verree & Co.....dis 5 %
Shingling, Nos. 1 2 3.....₩ doz $7 00 7 50 8 00
Claw, " 1 2 3.....₩ doz 7 50 8 00 8 50
Lathing, " 1 2 3.....₩ doz 7 00 7 50 8 00
Underhill's.....dis 10 %
Shingling, Nos. 1 2 3.....₩ doz 7 25 8 00 8 75
Claw, " 1 2 3.....₩ doz 7 75 8 50 9 25
Lathing, " 1 2 3.....₩ doz 12 00 11 00 13 00
Hinges.
Wrought Strap and T.....dis 20&10 %
Providence Plate.....{6 and 8 in. list 11c. } dis 20&5 %
{over 8 in. list 9½c. }
Screw Hook and Strap.....{5, 6, 10, 12 in. 7½c } net
{14 to 36 in. 5½c }
Heavy Welded Hook.....{8 to 12 in., 9c } dis 10 %
{14 in & up, 8½c }
Screw Hook and Eye.....{¼ to 1 in., 9½c } net
{⅝ in. 10½c }
{⅞ in. 12½c }
Hoes.
Solid Shank, C. S.....₩ doz $6 00—dis 30 %
Socket.....₩ doz 9 00—dis 30 %
Riveted Eye.....₩ doz 5 00—dis 30 %
Grub.....dis 20 %
Planters'—Winsted.....add 10 %
Scovill.....add 33⅓ %
Scovill Pattern (Winsted).....add 20 %
Hooks.
Belt.....dis 50 %
Clothes Line.....dis 60&10 %
Bench—Skinner's.....per doz $8 00, dis 30 %
Bench—Hotchkiss' $6 00 ₩ doz.....dis 10 %
Bench—Weston's No. 1, $8·50; No. 2, $7·00 per doz net
" —McGill's.....$8 00 per doz, dis 10 %
Wardrobe, Japanned.....new list dis 60&10 %
Hat and Coat " .....new list dis 60&10 %
Wrought Staples and Hooks and Staples.....dis 60, 10&10 %
Screw Hooks and Eyes, revised list.....dis 70&5 %
Grass.....dis 2½ %
Whiffletree—Patent.....dis 30 %
Hooks and Eyes—Malleable Iron.....dis 55 %
" " Brass.....dis 55 %
Horse Nails.
Putnam's.

No.	5	6	7	8	9	10
	32c	28c	26c	25c	24c	23c

In lots 2000 lbs. dis. 5 %.
Ausable

No.	5	6	7	8	9	10
	30c	21c	25c	24c	23c	22c

Pointed & finished.....31c 28c 26c 25c 24c 23c
In lots of 1000 lbs. 5 % discount.
Brundage.

No.	5	6	7	8	9	10
	29c	26c	24c	23c	22c	21c

In lots of 500 lbs., dis. 5 %.
American Pressed.

No.	5	6	7	8	9	10
	22c	20c	20c	30c	20c	20c

In lots of 1000 lbs. dis 5 %.
Perkins Finished (ready to drive).

No.	5	6	7	8	9	10
	31c	28c	26c	25c	24c	23c

In lots of 1000 lbs. dis 5 %.
Buffalo Forged.

No.	6	7	8	9	10
	28c	26c	25c	24c	23c

Globe (Pointed and Polished).

No.	5	6	7	8	9	10
	31c	28c	26c	25c	24c	23c

In lots of 1000 lbs., 5 % discount.
National (Pointed and Polished).

No.	5	6	7	8	9	10
Patent Finish	33	31	29	28	27	26
Extra "	30	27	25	24	23	22

In lots of 1000 lbs., dis 5 %.
Vulcan (Blued, pointed, ready to drive).

No.	5	6	7	8	9	10
	33c	30c	28c	27c	26c	25c

In lots of 500 lbs., 5 % discount.
" 1000 lbs 7½ % discount.
New London Horse Nails.

No.	6	7	8	9	10
Great Western	27c	25c	24c	23c	22c
U B	29c	27c	26c	25c	24c

In lots of 1000 lbs., dis 5 %.
Star Brand.....₩ ℔ 16c
Morgan.....14c
Horse Shoes.
Burden.....₩ keg, $5 85
R. I. Horse Shoe Co., Perkins Pattern.....₩ keg, 5 85
" " R. I. Pattern.....₩ keg, 6 35
Mule Shoes.....₩ keg, 6 85
Ice Picks.
Iron.....₩ gross $12 00 @ $16 00 net
White's.....per doz $2 00 dis 1 %
W. H.....per doz 1 00 dis 10 %
Dunlap's.....per doz 3 00 net
Kettles.
Brass.....₩ ℔ 35c net
In lots of 500 lbs.....₩ ℔ 30c net
Knives.
Ames' Butcher Knives.....dis 20 %
" Shoe " .....dis 15 %
Hay and Straw, "Wadsworth's".....dis 20 %
Knobs.
Base—Common.....net
" Plush Tip.....dis 10 %
" Elastic End.....reduced list dis 10&10 %
Ladles.
Melting.....dis 30 %
Lanterns.
Brady's Patent.....dis 10 %
Etna.....dis 10 %
Yankee.....dis 10 %
De Beque.....dis 10 %
Lines.
Chalk.....dis 40 %
Galvanized Wire Clothes.....per doz 9 00 net
Locks and Latches.
Cabinet—Eagle.....dis 25 %
Cabinet—Gaylord.....dis 25 %
Trunk.....dis 10 %
Continental.....dis 15 %
Shepardson's.....dis 20 %
American Lock Co.....dis 33⅓ %
Plate.....dis 25 %
Pad.....new list dis 5 %, and 2 % for cash
Barnes & Deitz.....dis 25 %
Yale Lock Co.....dis 40 %
Sargent & Greenleaf.....dis 20 %
Trenton Lock Co.....
Branford.....
Norwich.....
Russell & Erwin.....
Norwalk.....
Nashua.....
Mallory, Wheeler & Co.....
P. & F. Corbin.....
Parker & Whipple.....
Jacobus & Nimick Mfg. Co.....
} New list dis 45 %. 2 % extra for cash.
Mallets.
Hickory and Lignumvitæ.....dis 10&10 %
Meat Cutters.
Dixon's (P. S. & W.).....dis 10 %

No.	1	2	3
₩ doz	$14 00	$17 00	$19 00 $20 00

Hales'.....dis 25 %

No.	11	12	13
₩ doz	$37 00	$38 00	$42 00

Miles Challenge.....dis 20 %

No.	1	2	3
₩ doz	$27·00	$30·00	$40 00

Perry's Champion (P. S. & W.).....dis 10 %

No.	300	200	400
₩ doz	$22 00	$27 00	$40 00

Woodruff's (P. S. & W.).....dis 10

No.	100	150
₩ doz	$15 00	$15 00

American.....dis 25 @ 25&5 %

No.	1	2	2½	3	4	5
Each	$6 00	$9 00	$14 00	$15 00	$30 00	$75 00

Molasses Gates.
Stebbins' Pattern.....dis 60&10 %
Tinned ends.....dis 40&10 %
Patent Self-Measuring.....per doz $42 00—dis 20 %
Bush's.....dis 20 %
Lincoln's.....dis 50&10 %
Mortars and Pestles.
Iron.....net
Mouse Traps.
Wood Choker.....₩ doz holes. 16 @ 18c
Round, Wire.....₩ doz $1 50 to 2 00 net
Square, " .....₩ doz 2 00 to 2 50 net
Cage, " .....₩ doz 2 50, dis 10 %
Mowers, Lawn.
Excelsior.....dis 25 %
Nails.
Nail Pullers.
Capewell's Giant.....per doz $30 00 net
Nuts and Washers.
Nuts.....large, 5½c; small, 7½c off list.
Washers.....large, 7c; small, 9½c off list.

Oil Stones.
Washita No. 1.....₩ ℔ 22c
" Slips.....₩ ℔ 45c
Washita No. 2.....₩ ℔ 17c
Arkansas.....₩ ℔ 1 25
Hindostan.....₩ ℔ 6c dis 10&10 %
" Slips.....₩ ℔ 10c dis 10&10 %
Oilers.
Olmsted's.....new list dis 25&10 %
Broughton's.....dis 25&5 %
Malleable.....per doz $5 00 dis 10 %
Common Tin.....dis 30 %
" Zinc.....dis 30 %
" Brass and Copper.....dis 30 %
Ox Shoes.
Concave.....₩ ℔ 13c net
Picture Nails and Knobs.
Richards' Patent.....dis 40 @ 40&10 %
Judd's.....dis 60&10 %
Pinking Irons......per doz $8 00—dis 60&10 %
Planers.
Auburn Tool Co.'s.....dis 30&10 %
Enaenore, Bench.....dis 50 %
Chapin s, 1st quality.....dis 25&10 %
Chapin's 2d quality.....dis 33⅓&10 %
Greenfield Tool Co.....dis 25&10 %
" New York".....dis 40 %
Sandusky Tool Co., 1st quality.....dis 35 %
" " 2d " (Ogonts).....dis 50 %
Ohio Tool Co., 1st quality.....dis 35 %
" " 2d quality (Sciota).....dis 50 %
Owasco Tool Co., 1st quality.....dis 35&10 %
" " 2d quality.....dis 50 %
Howland's, 1st quality.....dis
Bailey's Patent Adjustable.....dis 20&10 %
Plane Irons, Butcher's.....$5 50 to £ gold—new list
" Auburn Tool Co.'s.....dis 25 %
" Chapin's.....dis 10&10 %
" Greenfield Tool Co.....net list
" Ohio Tool Co.....dis 10 %
" Spear & Jackson's.....5 50 to £ gold—new list
" Sandusky Tool Co.....dis 10 %
Plow Bits, Greenfield Tool Co.....dis 10 %
Pliers.
Button's Patent.....dis 33⅓ %
Plumbs and Levels.
Chapin's.....dis 66⅔&10 %
Standard Rule Co.'s New Adjustable.....dis 60&10&10 %
Stanley Rule and Level Co.....dis 60&10&10 %
Pumps.
Douglas Cistern, etc.....new list dis 25 %
" S. & F.....new list dis 20 %
Cucumber (Burlingham & Purdy)—
6 ft. No 8, with 12 ft. pipe.....$4·00 net
6 ft. No. 1, with 12 ft. pipe.....4·50 net
From 6 to 36 ft. add 20 cents per ft.
Pipe, 8c. per ft.; Coupling, 20c. per ft.
Rakes.
Cast Steel.....dis 30 %

$8 00	9 00	10 00	11 00
8	10	12	14 teeth.

Malleable.....dis 30 %

$5 00	5 80	6 00	6 50
9	11	13	15 teeth.

Razor Straps.
Evan's.....dis 25&10 %
Genuine Emerson.....dis 25 %
Hunt's.....dis 33 %
Chapman.....dis 10 @ 15 %
Torrey's.....dis 10 %
Saunder's.....net
Rivets.—Old Colony.
Iron and Tinned.....dis 25&7½ %
In bulk.....dis 7½ %
Copper Rivets and Burrs.....new list dis 25 %
Rods.
Stair.....new list dis 30 %
American Patent.....dis 30 %
Rollers.
Barn Door.....revised list dis 60&10 %
Rope. Manufacturers' List
Manila.....½ inch and larger ₩ ℔ 16 c
" .....⅜ inch ₩ ℔ 16½c
" .....¼ and 5-16 inch ₩ ℔ 17 c
" Lath Yarn, Fine Tar'd.....₩ ℔ 17 c
" Hay Rope.....₩ ℔ 16½c
Sisal.....½ inch and larger ₩ ℔ 12½c
" .....⅜ inch ₩ ℔ 13 c
" .....¼ and 5-16 inch ₩ ℔ 13½c
" Hay Rope.....₩ ℔ 13 c
Rules.
Chapin's Boxwood.....dis 66⅔&10 %
" Ivory.....dis 50&10 %
Hubbard & Curtiss Mfg. Co.....dis 60&20 %
Stanley Rule and Level Co.'s Ivory.....dis 50&10 %
" " " Boxwood.....dis 6 &10&10 %
Standard Rule Co.'s Boxwood.....dis 60&10&10 %
" " Ivory.....dis 50&10 %
Sad Irons.
Sad Iron, Nickel Stand attached.....₩ ℔ 9c
Sand Paper.....dis 7½ @ 12½ %
Bender & Adamson's (Flint) 00 to 1½.....$4 25 ₩ ream
" " 2, 2½, 3 &.....4 75 " "
Assorted.....4 25 " "
Star.....₩ ream $3 25
Emery.....₩ ream $6 50 @ 11 50
Cowdin Mfg. Co.....dis 7½ @ 10 %
Diamond Flint, 00 to 1½.....per ream $4 25
" 2, 2½, 3 and assorted.....4 75
" Emery Paper.....per ream $5 50 to $11 50
Sash Locks.
Clark's, Nos. 1 and 2.....dis 33⅓ %
Ferguson's.....dis 33⅓ %
Norwich.....dis 15 %
Walker's.....list net
Sash Weights.
Solid Eyes.....₩ ℔ 2½c
Sausage Fillers.
Perry's (P. S. & W.).....dis 10 %
No.....1 3
₩ doz.....$15 00 $21 00
Saw Rods.....dis 10 %
Saws.
Spear & Jackson's old pattern.....$4 50 to £ gold
Spear & Jackson's American Pattern.....$3·55 to £ gold
John Spear.....$3 60 to £ gold
Am. Saw Co.....new list
Perforated Cross Cuts, all kinds.....disc ₩ foot
Inserted Tooth.....dis 10 %
All Steel.....dis 12½ %
Disston's Circular.....dis 20 %
" Mill.....dis 25 %
" Cross Cut.....dis 25 %
" other kinds.....dis 12½ %
Livingston's Framed Wood.....dis 5 %
H. W. Peace's Circulars.....dis 10 %
Other kinds.....dis 10 %
Wm. McNiece's Hand, Cross Cut and Circular.....new list dis 15 %
Wm. McNeice's Patent Pole Pruning Saw.....dis 10 %
" " " Compass Saw.....net.
E. M. Boynton's Lightning, dis 30&5 %

Planished Oval O. G. Urns.....dis 25 %

Nos.	0	1	2	3	4	5	6	7	8
Each	$4·90	5·45	6·30	7·00	7·75	9·25	11·25	12·50	15·50

Planished Round Urns.....dis 25 %

Nos.	0	1	2	3	4	5	6	7
Each	$4·20	4·85	5·45	6·30	7·75	9·00	11·00	14·25

Planished Round Oyster Dishes, (Complete).....dis 25 %

Nos.	1	2
Each	$2·10	2·80

Planished Oyster Dish Plates.....dis 25 %

Nos.	1	2
Each	$0·25	0·30

Oyster Dish Covers.....dis 25 %

Nos.	1	2
Each	$0·30	0·35

Tea Pot Handles—P. S. & W.....dis 20 %

Stow's Patent Hollow Tea Pot Handles.

No. 1, Small 4½ inches.....per gross, $11·50
No. 2, Medium, 5¾ " ..... " 12·50
No. 3, Large, 6½ " ..... " 13·50
No. 4, Ex. Large, 7¼ in., for Wash Pitchers, &c..... " 18·00

Stow's Patent. New Pattern.

No. 25, Small, 4½ inches.....per gross, $11·50
No. 35, Medium, 5¾ " ..... " 12·00
No. 45, Large, 6½ " ..... " 13·00

Solid Iron, Tin Tipped.

No. 10, Small, 4¾ inches.....per gross, $9·00
No. 15, Medium, 5¼ " ..... " 9·50
No. 20, Large, 6½ " ..... " 10·75
Stow's Patent Hollow Tea Pot Handles, Adamantine Bronze—P. S. & W.

No. 12, Bronzed and Tin-Tipped.....per gross, $13·50

Saucepan Handles, Of Best Malleable Iron.
P. S. & W.....dis 20 %

Japanned.

No. 1, 5½ inches long.....per gross, $3·50
No. 2, 6 " ..... " 3·75
No. 3, 6½ " ..... " 4·00
No. 4, 7¼ " ..... " 4·25
No. 5, 8 " ..... " 4·50
No. 6, 9 " ..... " 4·75

Tinned.

No. 1, 5½ inches long.....per gross, $4·25
No. 2, 6 " ..... " 4·50
No. 3, 6½ " ..... " 4·75
No. 4, 7¼ " ..... " 5·25
No. 5, 8 " ..... " 5·50
No. 6, 9 " ..... " 5·75
Japanned.....per lb., 16
Tinned..... " 20

METALS.

IRON.—DUTY: Bars, 1 to 1¼ cents per lb., Sheet, Band, Hoop and Scroll, 1¼ to 1½ cents per lb. Provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 2 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. All subject to a reduction of 10 per cent. Railroad, 70 cents per 100 lbs. Boiler and Plate, 1½ cents per lb

Pig Iron—AMERICAN.

Foundry No. 1	₩ ton,	$31 00 @ 32 50
Foundry No. 2	"	29 00 @ 30 00
Gray Forge	"	27 00 @ 28 00
White and Mottled	"	

SCOTCH.

Coltness	"	40 00
Glengarnock	"	
Eglinton	"	33 00 @ 34 00
Summerlee	"	36 00 @ 37 00

Bar Iron.
Am. Renned, at mill.....₩ lb 2·8c @ 3c

Rails.

Welsh, gold	₩ ton,	43 00 @ 50 00
American, at works, currency	"	54 00 @ 58 00
Old Rails, currency	"	36 00 @

Scrap.
Wrought Scrap, from yard..... " 36 00 @ 38 00

Bar Iron from Store.

Common Iron.		
¼ to 2 in. round and square	₩ ton,	$ 65 00
⅝x3-16 in " "	"	70 00
½ in. " "	"	72 50
2¼ to 3 in. " "	"	70 00
1 to 6 in. wide x ⅜ and 1 in thick	"	65 00
1¼ to 6 in wide x ¼ & 5-16 in. thick	"	70 00
1 and 1⅜ in. x ¼ and 5-16	"	72 50
Swedish Iron		
1¼x⅜ and ½	"	155 00
1¼x⅝ to ⅝, and ¼ square	"	150 00
1¼ to 5x⅛ to ¼ and ⅜ to 2-in. square	"	145 00
6 to 8x⅛ and ⅜	"	160 00
Refined Iron.		
¼ to 2 in. round and square	"	67 50
1 to 6 in. wide x ⅜ to 1 thick	"	67 50
1¼ to 6 in. wide x ¼ and 5-16 thick	"	72 50
1 and 1¼ x ¼ and 5-16	"	72 50
Large Rounds.		
2¼ to 2¾, round and square	"	75 00
3, 3¼ and 3½ in.	"	80 00
3¾ and 4 in.	"	90 00
Rods—⅜ and 11-16, round and square	"	70 00
½ and 9-16, " "	"	72 50
7-16, " "	"	80 00
⅝, " "	"	85 00
5-16, " "	"	91 00
¾, " "	"	95 00
⅞-16, " "	"	127 50
Band Iron.		
1 to 6 in. x 3-16 to No. 12	"	85 00
Horse Shoe Iron.		
¼ and ⅝ x ⅜, to ½	"	97 50 @ 105 00
1 x ⅜, to ⅝	"	
Ovals, Half Ovals and Half Rounds.		
⅜ to 1½	₩ ton,	$ 90 00 @ 92 50
⅝ and 11-16	"	95 00 @ 97 50
⅞ and 9-16	"	100 00 @ 102 50
1-16	"	
⅝	"	
Nail Rods		
Best Norway	₩ lb	7¾ @ 8¾c
Norway Shapes		
½ to 2 in. x ⅛ to ⅝	₩ lb	7¾c
½ to ¾ square	"	
Norway Bar		
¾ to 2 in. square		
Spring Steel		
1 to 1¼ in. wide	"	8c
Tire Steel		
⅝ to 1¼ x ¼ and 5-16	₩ lb	7¼ @ 7½c
⅜ & 1 x 3-16	"	7½c
⅝ & 1 x ¼	"	8¾c
Toe Calk Steel		
⅜ to ¾ x ⅜ to ½	"	7¾c
Flaw Steel		
6 to 16 wide	"	8¾c
Sleigh Shoe Steel		
¾ to 1¼ x ⅜ to ⅝		6¾c
Hoops, ⅝ x No. 22	₩ ton	$150 00
" ⅝ x No. 20	"	120 00
" ⅝ x No. 19	"	115 00
" 1 and 1¼ x No. 18	"	107 50
" 1¼ to 2 and 1x1¼ x No. 13 and 14	"	95 00

Sheet Iron.

	Common English.	R. G. American.	R. G. English.
Nos. 10 to 20	₩ lb 4½ @ 4¾c	5¼c	6c
21 to 24	" 4¾ @ 5c	6c	6c
25 to 26	" 5 @ 5¼c	6c	6c
27	" 5¼ @ 5½c	6¼c	6¼c
28	"	6¾c	6¾c

Galvanized, 1. to 20, prime, ₩ lb 10; 2d quality...₩ lb 9c

"	21 to 24	"	"	11	" " 10c
"	25 to 26	"	"	12	" " 11c
"	27	"	"	13	" " 12c
"	28	"	"	14	" " 13c

Patent Polished..... " 15 @ 16c
Russia, Nos. 6 to 26..... ₩ lb 18c
" Stained, No. 1..... " 17c
Belgian..... " 12c

One piece Corrugated Sheet Iron Elbows.

CHARCOAL IRON

4½	5	5½	6	7 inch.
$2·50	3·50	4·50	5·25	6·50 per doz.

RUSSIA IRON.

5	5½	6	7 inch.
7·00	9·50	12·00	14·00 per doz.

BABBITT METAL.

Excelsior..... cash, dis 10 %

No.	1	2	3	Extra.
	10c	12c	15c	20c @ 25c.

Brass.

ROLLED AND IN SHEETS.
(Brown & Sharp's Gauge.*)
For the purchase of 100 pounds and over at one time

HIGH BRASS.

All Nos. to No. 28, and widths 14 in. and under.....34c
All Nos. to No. 38, inclusive, and widths over 14 to 20 in. inclusive.....34c
Over 20 in. to 30 in. inclusive.....40c
½c ₩ lb advance on each No. above No. 28 to 38, inclusive.
All Brass thinner than No. 38 is Platers' Brass at.....58c
Sheets 24x48 in., and all sheets cut to particular sizes and lengths.....40c
Painters' Rules.....44c
Sheets wider than 30 in. and under 40 in.....44c
" 40 in. and over.....46c
Circular sheets, in diam. from 4 in. to 14 inclusive....44c
" " over 14 in. to 20 " 47c
" " " 20 in. to 30 " 50c
" " " 30 in. to 40 " 53c
" " " 40 in. 56c
Brass Rods above No. 0, and under 1 in.....43c
" 1 in. and over.....47c

LOW BRASS.

6c ₩ lb more than High Brass.
Gilding Metals, 7c ₩ lb more than High Brass.
Platers' or Gold Metal { In Bars..... 46c / Sawed..... 49c

FOR SLITTING: Metal in Width.

¼ in. to ⅜ in., to No. 30, inclusive, 1c ₩ lb advance.
⅜ in. to 1 in., thinner than No. 30, 2c ₩ lb advance.
1 in. to ⅜ in., " " 30, 3c " "
⅛ in and less to No. 30, 2c ₩ lb advance.
⅛ in. and less thinner than No. 30, 5c ₩ lb advance.
10 % discount.

SCRAP—NEW METAL.

High Brass Scrap, 17 cents, net.
Low " 19 " "
Gilding, 21 cents, net.
Turnings, Fillings and Chips, half the price of Scrap Sheet.

BRASS AND COPPER WIRE
(Stub's Wire Gauge).

	High Brass.	Low Brass.	Gild'g and Cop'r
Nos. 0 to 20	37	41	47
Nos. 21, 22, 23	38	42	48
Nos. 24 and 25	39	43	49

Brass Wire straightened and cut, 4 cents advance.
10 ¢ discount

FINE WIRE—NET PRICES.

	High Brass.	Low Brass.	Gild'g and Cop'r
No. 26	0·41	0·45	0·51
" 27	0·44	0·48	0·54
" 28	0·46	0·50	0·56
" 29	0·43	0·52	0·58
" 30	0·50	0·54	0·62
" 31	0·52	0·56	0·66
" 32	0·56	0·60	0·71
" 33	0·60	0·64	0·81
" 34	0·64	0·68	0·91
" 35	0·69	0·73	1·03
" 36	0·78	0·82	1·15
" 37	0·93	0·58	1·23
" 38	1·28	1·28	1·63

Ten cents per pound extra for Spooling.

TUBING
(Brown & Sharpe's Gauge.)

	₩ lb
Plain to No. 20, inclusive	$0·52

Nos. 21, 22, 23, 2c. advance on List for each No.
Nos. 24, 25, 26, 4c. " "
Above No. 26 special rates.

Plain Tube, 1-4 inch	68
" 3-16 "	1 68
" 1-8 "	1 78

All Mandrel-Drawn Tubes 5c. advance on List.
Fancy Tubing 4c. advance on List above Plain.
English, Scotch, and Extra Patterns Fancy Tubing to No. 20..... 61
Tubing sawed or cut 2 to 4 ft. long, 2c. advance on List.
Add to two cents a half-cent for each additional cutting under two feet. 10 % discount.
BRASS DOOR RAIL—48 cents per lb.—10 % dis.
BELT AND HOSE COPPER RIVETS AND BURS., dis. 25 %.

Price per ₩	49	50	52	54	56	58	60	64	68c
Nos.	7	8	9	10	11	12	13	14	15

Braziers Rivets, 43 cents per pound discount 10 %.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire
4 per cent. 12 inch. to No. 26	0·75	0·90
6 " " " "	0·95	1·00
10 " " " "	1·05	1·25
15 " " " "	1·30	1·55
18 " " " "	1·45	1·75
20 " " " "	1·55	

Discount 10 %.
German Silver Sheets over 12 inches wide and weighing more than 10 lbs.....$2·10 ₩ lb net
Advance two cents for each additional inch in width above 12 inches, and two cents per pound on each No. thinner than Nos. 26 to 36, inclusive.
All German Silver thinner than No. 36 is Platers' at 50 cents per pound additional.
German Silver Scrap, one-third less than net price of 12 inch Market Metal; German Silver Turnings, Fillings and Chips, half the price of Scrap.
* Brown & Sharp's Gauge is about two numbers finer than Stubs' Wire Gauge.

COPPER—DUTY: Pig, Bar and Ingot, 5c.; old copper, 4 cents ₩ lb; Manufactured (including all articles of which copper is a component of chief value) 45 % ad valorem. All subject to a reduction of 10 per cent.

American Ingot.....₩ lb 26 @ 26½c
English " "

SHEATHING, BRAZIERS COPPER, BOLTS, &c.

Braziers Copper, ordinary sizes, over 16 oz., per square foot.....35c ₩ lb
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot.....32c. "
Braziers' Copper, 12 oz. per square foot and lighter.41c. "
Circles less than 24 inch in diameter.....38c. ₩ lb
Circles, 24 inch diameter and over.....41c. "
Segment and Pattern Sheets.....38c. "
Locomotive Fire Box Sheets.....35c. "
Sheathing Copper, over 12 oz. per sq. ft.....33c. "
" 12 oz. ₩ sq. ft. and lighter... 41c. "
Bolt Copper.....35c. "
No Copper in Sheathing except 14x48 inches, and not to exceed 34 oz. to the square foot.

TINNING.

14x48, by the case	8c. ₩ sheet
14x48, less than case	10c. "
Boiler Sizes, 7 and 8 inch	12c. "
" 9 inch	15c. "
Other sizes not larger than 30x60	2½c. ₩ sq.
Larger than 30x60	5c. "
Copper Bottoms, 34 @ 36c. ₩ lb	net

O'NEILL'S PATENT PLANISHED COPPER.
14x48.

14 and 16 oz. and heavier	39c.	By the case, 38c. ₩ lb
12 oz. and lighter	42c.	" " 41c. "

Boiler Sizes.
7 in., 14x52. 8 in., 14x56. 9 in., 14x60
14 and 16 oz. and heavier.....41c. By the case, 40c. ₩ lb
(And all sizes not over 20 inches wide.)
30x60
14 and 16 oz. and heavier.....43c. ₩ lb
12 oz. " 46c.

LEAD—DUTY: Pig, $2 per 100 lbs.; old Lead, 1½ cent per lb.; Pipe and Sheet, 2½ cents per lb. All subject to a reduction of 10 per cent.

Spanish	6½ @ 6¾c gold
German Refined	6½ @ 6¾c gold
English	6½ @ 7c gold
American	5·75 @ 5·80 gold
Bar	dis 20 % 33½c.
Pipe	dis 20 % 39c.
Tin Lined Pipe	dis 10 % 16½c.
Sheet	dis 10 @ 20 % 9c.
Shot	dis 20 % Drop, 9c.; Buck, 9½c.
Solder	No. 1, 15 @ 15½c: No. 2, 13¾ @ 14c

STEEL—DUTY: Bars, Ingots, Sheets and Coils, valued at 7 cents per lb., or under, 2¼ cents; over 7 cents, and not above 11, 3 cents per lb.; over 11, 3¾ cents per lb. and 10 % ad val. Railway Bars 1¼ cents per lb. Railway Bars, in part Steel, 1 cent per lb. All subject to a reduction of 10 per cent. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as Steel.

American Cast Steel.

Tool	15 @ 16c
Spring	10c
Homogeneous	12½c
Tire	12½ @ 13½c
Machinery (round and square)	10 @ 11c
File	11c
Sheet	14 @ 16c
Saw Plate, mill and mulay	14 @ 16½c
Saw Plate, gang and X cut	13 @ 14c
" circular as to size	18 @ 30c

Chrome Steel.

Tool	₩ lb 20 @ 21c
Tool, extra fine	40 @ 75c
Spring	₩ lb 13c and upward
Machinery	₩ lb 14c.
Hammer	12c.
Gun or Homogeneous	" 16c

English Steel.—payable in gold, dis 5 % cash.

" Best Cast	₩ lb 18c
" Extra Cast	" 19c
" Round Machinery, Cast	" 11½c
" Swaged, Cast	" 18c
" Best Double Shear	" 18c
" Blister, 1st quality	" 13½c
" " 2d quality	" 11½c
" " 3d quality	" 10½c
German Steel, Best	" 11½c
do 2d quality	" 10½c
Sheet Cast Steel, 1st quality	" 18c
" " 2d quality	" 16c
" " 3d quality	" 14c
File Steel, Flat and ½ Round	" 12½c
" Square and Round	" 13c
" Mill	" 13½c
" Taper to 4 inch	" 17c
" Taper 3 and 3¼ inch	" 18c

SPELTER—DUTY: In Pigs, Bars and Plates, $1 50 per 100 lbs.—less 10 per cent.

Silesian, cash	6¾ @ 7c., gold
American	7¾ @ 11c., currency

TIN—DUTY: Plates, Sheets, Tagger and Terne, 15 per cent. ad val.; Electro-galvanized Plates, 2 cents per ₩ lb; Manufactures of, not enumerated, 35 per cent. ad val.—all subject to a reduction of 10 per cent. Bars, Block and Pigs, free. Banca, subject to duty of 10 per cent.

Banca	₩ lb 47c., gold
Straits	₩ lb 25c. gold
English	₩ lb 24 @ 24c., gold

CHARCOAL TIN PLATE.

I C 10x14, Prime Charcoal	11 75 @ 12·00
12x12, "	12·50
14x20, "	12·75
I X 10x14, "	14·25
12x12, "	14·75
14x20, "	15·00
D C 12½x17 "	11·50
D X 12½x17 "	13·75
For each additional X add	2·25

COKE TIN PLATE.

	Best	2d Quality.	Ordinary.
I C 10x14	$11·00 @ 11·25	10·00 @ 10·25	9·00 @ 9·50
I C 12x12	11·50	10·75	
I C 14x20	11·75	10·75	

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20	$10·50 @ 10·75	10·00 @ 10·25	8·00 @ 9·00
I X 14x20	13·25		
I C 20x28	21·00 @ 22·00	20·00 @ 21·00	17·00 @ 19·50
I X 20x28	27·50		
I C 20x200 ft.	25·00		

ZINC—DUTY: Pig or Block, $1 50 per 100 lbs. Sheet, 2½c. ₩ lb. All subject to a reduction of 10 per cent.

Sheet	cask 9¼c
"	open 10c

Paper Stock, Old Metals, &c.

(Dealers' Selling Prices.)

Canvas linen	6¼ @
" cotton. No. 1	6¾ @ 7
" " No. 2	@ 4
White linen rags. No. 1	@ 7¼
" " No. 2	@ 5
Colored	2½ @
Mixed woolens	@ 3
Soft woolens	@ 5¼
Gunny bagging	1¾ @ 2
Jute Butts	2¼ @ 2¾
Kentucky bagging	5¼ @ 5½
Book stock	4 @ 4¼
Waste paper and scraps	1½ @ 3
Rope cuttings	1¾ @ 3
Kentucky Bale rope	4 @ 4¼
Oakum junk, No. 1	5¼ @ 5¾
" No. 2	4 @ 4¼
Grass rope	3¾ @ ..
Tarred Shaking	1½ @ ..
White Collar Cuttings, all paper	7 @ ..
" " muslin lined	5 @ ..
" Envelope "	7 @ ..
Hard White Shavings, No. 1	6¼ @ ..
Soft " " No. 1	6 @ ..
White Shavings, No. 2	5¼ @ 6
Mixed Shavings, part white	4 @ 4¼
Imperfections, No. 2, best folded sheets	5 @ ..
" " 1, Heavy Stock	4¾ @ 5
Book Stock, Mixed	3½ @ 4
" " No. 2, light	2¾ @ 3
Prints	1¾ @ 2
Pure Manilas	2½ @ 2¾
Bogus Manilas and Hardwares	1¾ @ 1¾
Commons	1 @ ..
Binders' Board Cuttings	1½ @ 2
Straw Board Cuttings	1¼ @ 1¾

Old Metal.

Copper	21 @ 22
Yellow metal	14
Brass	14
Heavy Composition	18 @ 19
Old lead, solid	5¾
Tea lead	4½
Wrought iron	1¼ @ 1⅝
Sheet iron	0¾ @
Cast iron	1 @ 1¼
Machinery iron	1¼ @ 1⅝
Zinc	5¼
Pewter, No. 1	24 @ 33
" No. 2	10 @ 12
Spelter	7

Paints, Oils, etc.

Paints.

Black, lamp—Coach Painters	₩ lb 20c
" " Ordinary	8c
" Ivory Drop, fair	15c
" " best	26c
Black Paint, in oil.....kegs, 8c.; asst'd cans, 11 c	
Blue, Prussian, fair to best	50 @ 75c
" " in oil	35 @ 65c
" Chinese, dry	33c
" Ultramarine	25 @ 30c
Brown, Spanish	1¾c
" Van Dyke	9c
Carmine, 40	$12 00
Green, Chrome	15 @ 23c
" " in oil	18 @ 25c
" Paris.....good, 30c; best,	40c
" " in oil..... " 30c "	45c
Mineral Paints	1¾ @ 4c
Orange Mineral	14½c
Red Lead, American	9½c
" " English	10½c
" Venetian (N. C.) dry	2¾c
" " in oil.....asst'd cans, 11c; kegs,	8½c
" Indian, dry	10c
Rose Pink	13c
Sienna, American, Raw	4c
" Turut	4½c
" " in oil	16 @ 20c
" Raw "	15 @ 25c
Umber, Burnt	4 @ 5c
" " in oil	16 @ 21c
" Raw	3½ @ 7½c
" " in oil	16 @ 22c
Vermillion, Chinese	$1 92
" English	1 87
" Trieste	1 65
" American, Common	23c
White Lead, American, pure dry	10½c
" " " in oil	11½c
White, Paris, English, prime.....in bbls. 2½ @ 2¾c	
Yellow Ochre, French	2½ @ 2¾c
" " in oil.....asst'd cans, 11c; kegs,	8½c
" Vermont.....in casks	1¾c
" Chrome	17 @ 21c
" " in oil	18 @ 25c
Zinc White, American No. 1 dry	9c
" " No. 1, in oil	11c
" French (Paris)	11 c
" " in oil	12

Oils.

Linseed Raw	₩ gal. casks, 86c. bbls. 87c
" Boiled	" 91c. " 92c
Whale, Crude	"
" Bleached Winter	"
Sperm, Crude	" 1·65
" Winter unbleached	" 1·55
" Bleached	" 1·90
Seal, Extra Refined	"
Lard, Pure Winter	" 90c
" Spring	"
Cotton Seed, Crude	" 60c
" Southern Yellow	" 65c
" White	"
Neatsfoot, Winter	70c @ $1·10
Natural Lubricating	38c @ 40c

Sundries.

Asphaltum	8c
Benzine	₩ gal. 16c
Chalk	1¾c
" Block	
Dryer, Patent, Am'n	asst'd cans, 10c.; kegs 9c
" English	" 11c. " 9c
Flocks	
Frostings	50c
Glue, White	33 @ 47c
" Sheet	30c
Glaziers' Points, Zinc	9c
Gum, Copal	36c
" Damar	25c
" Shellac, English	60c
" " " dark	50c
Litharge	10c
Pumice Stone, selected Lumps	4 @ 6c
" powdered	4c
Putty in bladders	5½c
" in bulk	3c
Rotton Stone, soft, English	8c
Spirits Turpentine	38c
Whiting, Spanish	1c

Glass.

French Window—1st, 2d, 3d, and 4th qualities. Per box of 50 feet.

SINGLE.

SIZES.	I.	II.	III.	
6 x 8 to 10 x 15	$10·25	$9·25	$8·75	$8·00
11 x 14 to 16 x 24	12·00	11·00	10·00	9·50
18 x 22 to 20 x 30	15·00	13·50	12·00	10·50
15 x 36 to 24 x 30	17·50	15·25	12·50	
26 x 28 to 24 x 36	18·25	16·00	13·25	
26 x 36 to 26 x 44	20·00	18·00	14·50	
26 x 46 to 30 x 50	21·00	19·00	15·25	
30 x 52 to 30 x 54	22·50	20·25	16·25	
30 x 56 to 34 x 56	24·50	21·75	19·00	
34 x 58 to 34 x 60	26·00	24·50	21·50	
36 x 60 to 40 x 60	30·50	27·00	24·50	

DOUBLE.

SIZES.	I.	II.	III.	IV.
6 x 8 to 10 x 15	$16·50	$15·00	$14·00	$13·00
11 x 14 to 16 x 24	19·25	17·75	16·00	15·25
18 x 22 to 20 x 30	24·00	21·75	19·25	
15 x 36 to 24 x 30	28·00	24·50	20·00	
26 x 28 to 24 x 36	29·25	25·75	21·25	
26 x 36 to 26 x 44	32·00	29·00	23·25	
26 x 46 to 30 x 50	33·75	30·50	24·50	
30 x 52 to 30 x 54	36·00	32·50	26·00	
30 x 56 to 34 x 56	39·25	35·00	30·50	
34 x 58 to 34 x 60	41·75	39·25	34·75	
36 x 60 to 40 x 60	49·00	43·25	39·25	

Sizes above—$12·00 per box extra for every 5 inches.
An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 84 united inches, will be charged in the 84 united inches bracket.
Discounts 60&10 @ 60&15 %.

A. C. Downing & Comp'y,

Wm. C. Stuart. Francis Dougherty.

Importers of and Dealers in

Window Glass,

FRENCH PICTURE

And Car Glass, etc.

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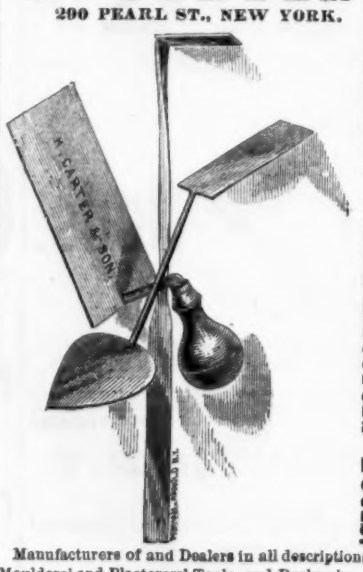
200 PEARL ST., NEW YORK.



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Manufacturers of and Dealers in all descriptions of Moulders' and Plasterers' Tools, and Dealers in General Hardware, Gilded Copper Weather Vanes, CARTERS' PATENT CARRIAGE LIFTING JACK, &c.

Hardware.

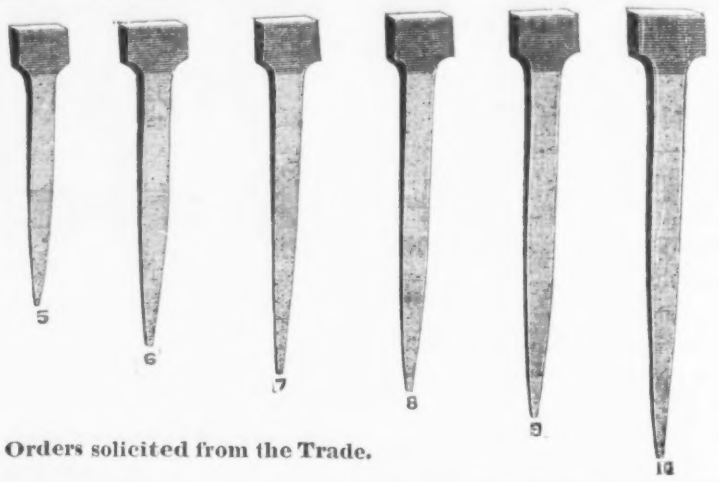
PRATT & CO.,

Hardware & Iron Merchants, Buffalo, N. Y.

Manufacturers of the Superior Brand,

BUFFALO FORGED HORSE NAILS.

These Nails are superior, being made with new and improved machinery and actually hammered from the best brands of Norway Iron.



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REPRESENTS:

PRATT & CO., Nuts, Washers, Crow Bars, Horse Nails, &c.
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WOOLWORTH HANDLE WORKS, Axe, Pick & Sledge Handles, &c
CHALLENGE Augers and Bits, Union Bolts, and Spoke Shaves.
DERBY SILVER CO., Fine Plated Spoons, Forks and Ladles.
H. T. MILLER, Hatchets and Edge Tools.
D. H. GOODELL, Lightning and Turn Table Apple Parers, &c.
ELEPHANT Edge Tools, Axes, Handles and Tools.
SIDNEY SHEPARD & CO., French, Stamped & Japanned Tin
NATIONAL HORSE NAIL CO., Polished & Finished Horse Nail
W. F. H. AMWAKE, Scandinavian Pad Locks.
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Philadelphia Forging Works.

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BUFFALO, N. Y.

TRADE Established in 1836. MARK BUFFALO, N.Y.

MANUFACTURERS OF

FRENCH WARE, STAMPED AND JAPANNED

TIN WARE,

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Upon which to run the same, of all kinds.

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Locks, Hinges, Hooks and Staples, Awning Hooks, Meat Hooks, Pincers, Champion Noiseless Pulleys,

CHAIN PULLEYS, &c.

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BRADFORD & SHARP,

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We furnish many of the largest Iron Mills in the West, and guarantee quality of all goods sold.

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Manufacture **Iron Chain** of every description.

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DRAWING KNIVES.

The VERY BEST, made by

OHIO TOOL CO., Columbus, O.

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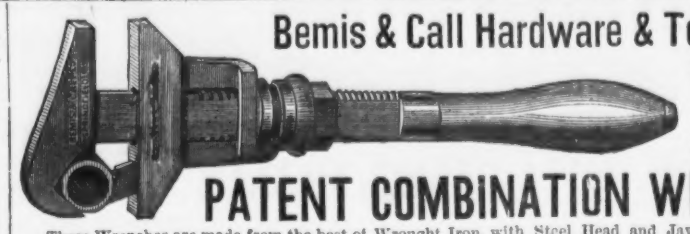
Bemis & Call Hardware & Tool Co.'s



This Wrench can be furnished with Briggs Pat. Nut or Sleeve.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-Hardened throughout. And not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench. Thus making a Combination which has no equal.

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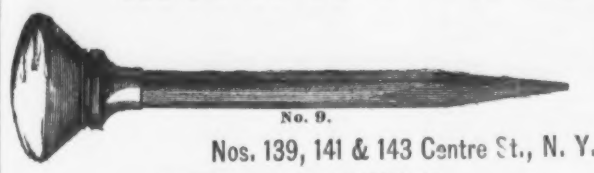
MARKT & CO.,



No. 9.

Nos. 139, 141 & 143 Centre St., N. Y.

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DOOR KNOBS (Lava, Wooden, Porcelain & Mineral), SHUTTER, PICTURE AND DRAWER KNOBS,

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BRIGHT WIRE GOODS,

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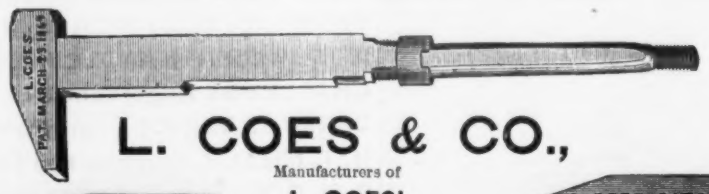
FURNITURE NAILS,

Bright Halter & Coil Chains, French Wire Nails,

Wrought Iron and Brass Butts.

Having consignment of one of the largest German manufacturers of **Halter and Coil Chains**, we can offer inducements on these goods.

We shall be pleased to send our new lists and prices to those who will apply.

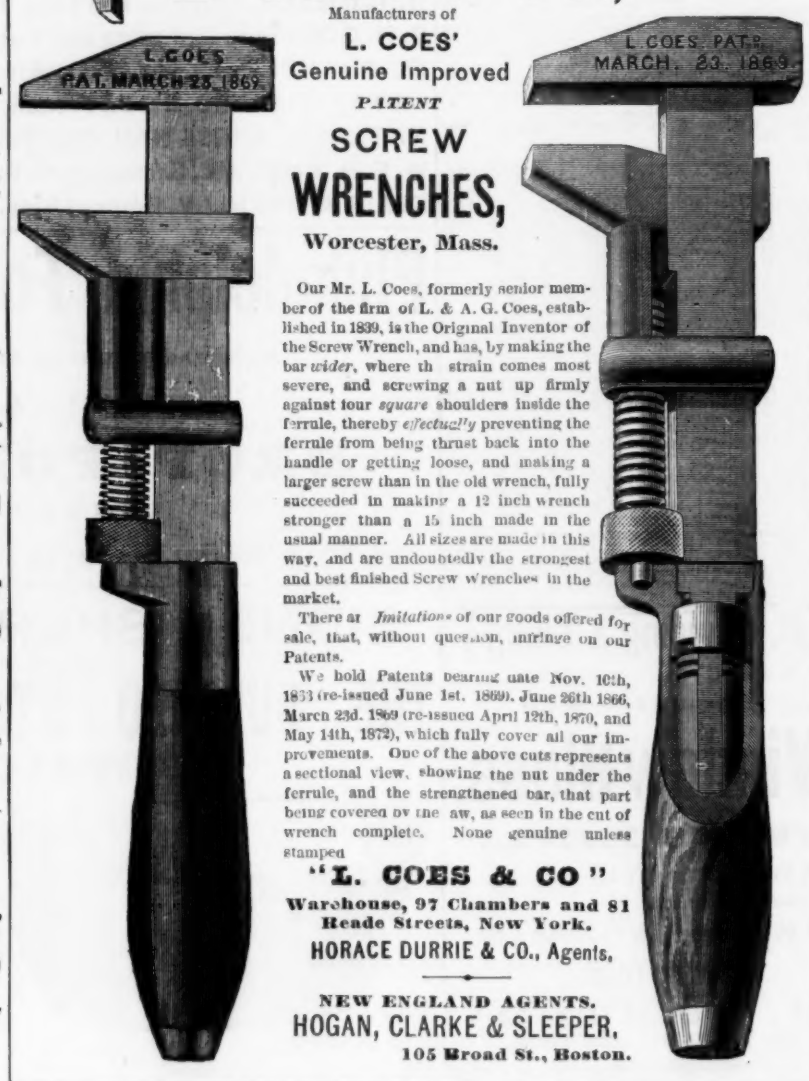


L. COES & CO.,

Manufacturers of

L. COES' Genuine Improved *PATENT* SCREW **WRENCHES,**

Worcester, Mass.



Our Mr. L. Coes, formerly senior member of the firm of L. & A. G. Coes, established in 1839, is the Original Inventor of the Screw Wrench, and has, by making the bar *wider*, where th strain comes most severe, and screwing a nut up firmly against four *square* shoulders inside the ferrule, thereby *effectually* preventing the ferrule from being thrust back into the handle or getting loose, and making a larger screw than in the old wrench, fully succeeded in making a 12 inch wrench stronger than a 15 inch made in the usual manner. All sizes are made in this way, and are undoubtedly the strongest and best finished Screw Wrenches in the market.

There ar *Imitations* of our goods offered for sale, that, without question, infringe on our Patents.

We hold Patents bearing date Nov. 10th, 1863 (re-issued June 1st, 1869), June 26th 1866, March 23d, 1869 (re-issued April 12th, 1870, and May 14th, 1872), which fully cover all our improvements. One of the above cuts represents a sectional view, showing the nut under the ferrule, and the strengthened bar, that part being covered by the jaw, as seen in the cut of wrench complete. None genuine unless stamped

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Warehouse, 97 Chambers and 81 Reade Streets, New York.

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NEW ENGLAND AGENTS.

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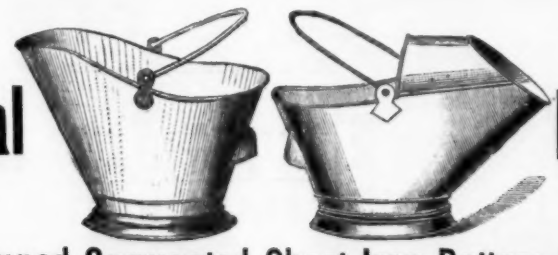
Coal  **Hods.**

Stamped Corrugated Sheet Iron Bottom Riveted.

We manufacture six styles having our patent corrugated bottom, and all having the body bottom and hoop riveted together. Dealers before buying will find it to their advantage to get our prices, and also to beware of a seamed hod that is in the market, somewhat similar in shape to ours. Don't buy any but the **Corrugated Riveted Bottom Hod**, manufactured by

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TIN WARE.

FRY PANS, FIRE SHOVELS, ASH SIFTERS, &c. Send for Catalogue.

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JOHN T. LEWIS & BROS. WARRANTED PURE WHITE LEAD. PHILADA.

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Established 1782.

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Brooklyn White Lead Co.

BROOKLYN WHITE LEAD CO., INCORPORATED 1825
SUPERIOR—PURITY, DURABILITY AND COLOR.
ADDITIONAL TRADE MARK.
We caution consumers ag'nst the numerous spurious brands, in imitat'n of ours, of adulterated and greatly inferior qualities—which are sold as our LEAD.
$50 Reward for detection of counterfeits.
F. HOWE, Tr.
Office, No. 89 Maiden Lane, NEW YORK.
BROOKLYN WHITE LEAD COMPANY PREMIUM LEAD WARRANTED PURE
COPYRIGHT SECURED. OLD STANDARD BRANDS.

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White Lead, Red Lead and Litharge.

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FISHER HOWE, Treas.

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WHITE LEAD.

JEWETT & SONS' PERFECTLY PURE WHITE LEAD.

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FORTY-SECOND YEAR.

WARRANTED

EDGE TOOLS.

Goods stamped "D. R. Barton & Co." are NOT made by me.

For GENUINE "D. R. Barton" Edge Tools, Planes, Axes, &c., be sure to address D. R. BARTON, and NOT D. R. Barton & Co.

Factory and Office, Mill Street, cor. of Furnace.

D. R. BARTON, Rochester, N. Y.

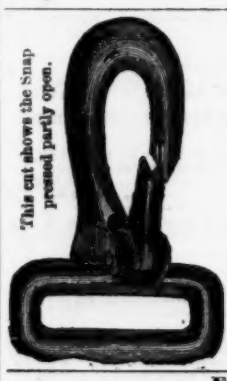
Iron & Brass Wood Screws.

Full assortment constantly on hand.

ALFRED FIELD & CO.,

Importers,

47 John, and 5 Dutch Streets, N. Y.



This cut shows the Snap pressed partly open.

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MIDDLETOWN, CONN.,

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The Celebrated "Baldwin" Plane Iron,

HENSHAW'S PATENT HARNESS SNAPS

GERMAN HARNESS SNAPS,

PAT. GAFF TOP-SAIL SELF-MOUSING SHIP HOOKS

Plow, Fillettster & Dado Stops of all kinds. Set Screws for Plows, Bench Plane Starts, &c. Patent Washer Cutters. Plane Iron Screws to order of any size.

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ESTABLISHED A. D. 1833 and 1855.

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Fairbanks' Standard Platform and Counter Scales, Paint and Coffee Mills, Builders' and Domestic Hardware generally.

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ALFRED FIELD & CO.,

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IMPORTERS AND EXPORTERS.

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A large line of Birmingham and Sheffield goods in stock at

47 John & 5 Dutch Sts., N. Y., & 75 Gravier St., New Orleans.

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OFFICES AND WAREHOUSES:

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REMSCHEID and SOLINGEN (Prussia.) H. Boker & Co.
SHEFFIELD (England), No. 3 Arundal Lane, Represented by Mr. Arthur Lee.
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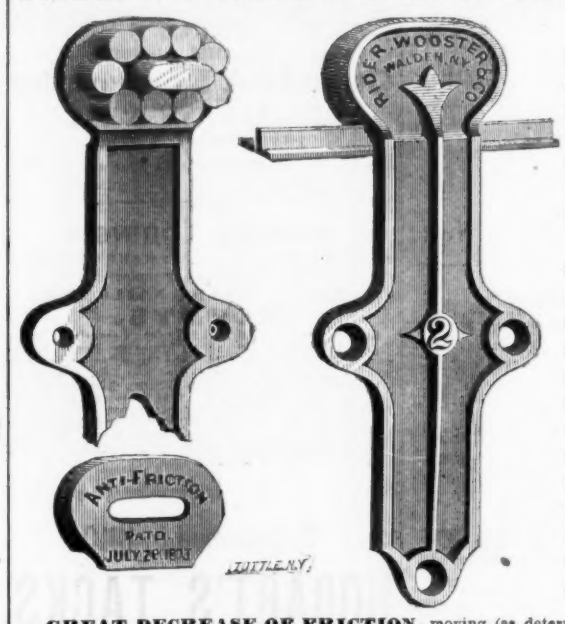

This Hanger is entirely new in principle and design, and possesses marked advantages over all others, entirely obviating all the defects and annoyances hitherto experienced in the use of ordinary sheaved hangers.

In construction it is exceedingly simple, as will be seen by the cut. The weight of the door is supported by a strong stud, between which and the rail is a series of chilled iron rollers, inclosed by the front of the hanger and cap, and as these rollers pass under the stud, they are returned over it in succession. There is consequently no friction, except that of rolling surfaces. Its leading advantages are:

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Great Strength. Unlimited Durability.
No Axles and Sheaves to grind and break.
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Thorough protection from the weather.
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It cannot run off the track.
It causes the door to run perfectly true.
It cannot get out of order.
It is compact, Simple and Beautiful in design.

This Hanger will fit any ordinary rail, but our rail is preferable, from the fact that it has a double flange at the bottom, so that the screws will not work out and allow it to rock or tip over.

No. 1 Hanger, corresponding to 4, 5 and 6 in. Sheaves or Rollers.....per pair, $1·25
No. 2 " " 6 inch and upward..... " 1·50
One Dozen Pairs in each case.—dis 30 per cent.
RAIL, with Double Flange.....per foot, 7 cents.
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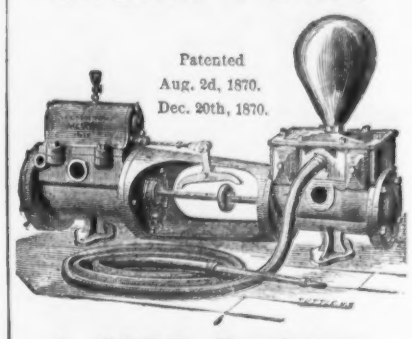

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It is Unsurpassed as a Mining Pump.

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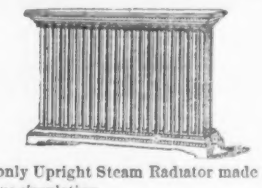

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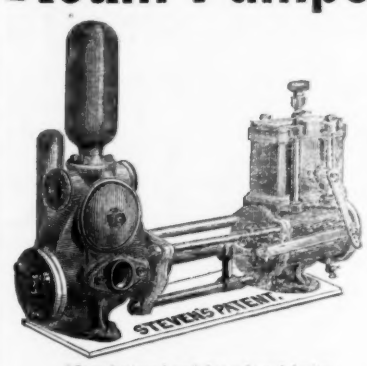

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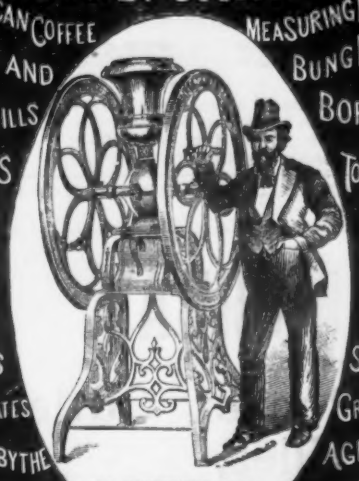

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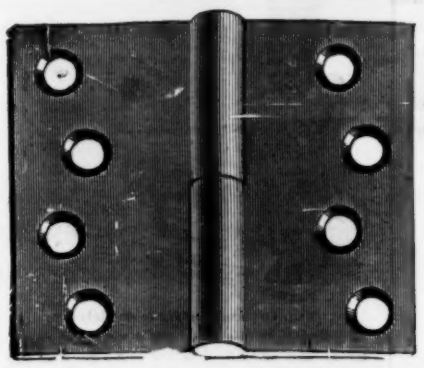

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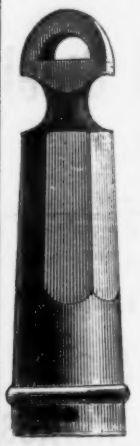

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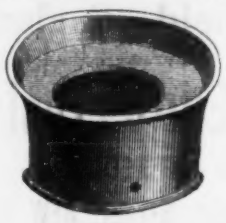

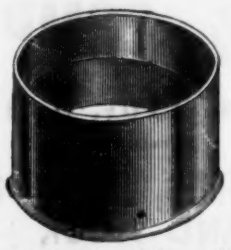

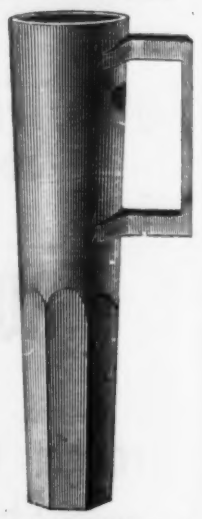

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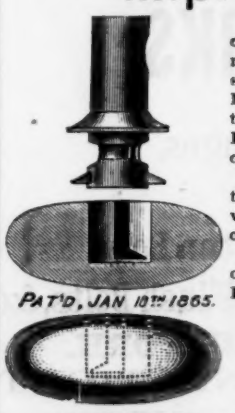

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Fry Pans.

Tinned.....							dis 20 %
₱ doz..	$3 00	3 25	3 62	4 00	4 50	5 00	5 50	6 00	7 50
No.....	0	1	2	3	4	5	6	7	8
Burnished.....									
₱ doz..	$2 50	3 00	3 38	3 75	4 13	4 50	5 00	5 62	6 75
No.....	0	1	2	3	4	5	6	7	8

Files.
Nicholson Mill Files.... new list, $5 00 to £ cur dis 10 %
" Bastard..... " 5 00 to £ cur dis 10 %
" Taper..... " 5 00 to £ cur dis 10 %
Butcher's Mill.....$5 75 to £ gold
" Bastard..... 5 50 to £ gold
" Taper..... 5 50 to £ gold
Moss & Gamble—Mill, Taper and Bastard.....5 50 @ 5 25 to £ gold
Flaring Machines.
K. F. M.—4¼ in. rolls, $5 50.....dis 10 %
" —6 in. rolls, $6 75.....dis 10 %
Mrs Knox—4 in. rolls, $5 50.....dis 10 %
" —6 in. rolls, 6 65.....dis 10 %
Hammers.
Yerkes & Plumb's.....dis 10 %
Hammond & Son's.....dis 10 %
Verce.....dis 10 %
Hatchets.
Beatty's.....dis 10 @ 15 %
Shingling and Half. { ₱ doz.. $7 00 | 7 50 | 7 75 | 8 00
{ No..... 1 | 2 | 3
Yerkes & Plumb.....dis 10 %
Shingling and Half. { ₱ doz.. $7 00 | 7 50 | 8 00 | 8 50
{ No..... 1 | 2 | 3 | 4
Claw.... { ₱ doz..... $7 50 | 8 00
{ No..... 1 | 2 | 3
Hinges.—Strap and T.....dis 20 &10 %
Bonney's No. 1 Gate.....dis 25 %
" No. 2 and 3.....dis 35 %

Horse Nails.	Nos.	6	7	8	9	10
Ausable		27	25	24	23	22
Globe		28	26	25	24	23
Brundage		26	24	23	22	21
	Nos.	5	6	7	8	9	10
Putnam		32	28	26	25	24	22

On Ausable, Globe and Brundage 1000 ℔ lots.....dis 5 %
Knobs.—Door, Mortise and Rim.
Makes in Combination.....new list dis 45 %
Extra discount for cash 2 %
Mineral and Rim.....dis 5 %
Locks and Latches.—Rim and Mortise.....dis 45 %
Extra discount for cash 2 %
Till and Cupboard.....dis 25 %
American Padlocks.....dis 50 %
Scandinavian Pad Locks.

₱ doz.....	$10 50	10 50	12 00	12 00	15 00	15 00	dis 15 %
No.....	9	9½	10	10½	11	11½	
₱ doz.....	$18 00	18 00	22 00	22 00			dis 15 %
No.....	12	12½	13	13½			

Trunk Locks.....dis 5 @ 10 %
Tea and Rouge and Latches.....dis 25 %
Lanterns.—Square Candle and Oil.....dis 10 %
Globe for Oil.....dis 10 %
" " Kerosene.....dis 10 %
Tubular Lanterns.....dis 10 %
Matlocks.—Long and Short Cutter.....dis 25 %
Western Pattern.....dis 25 %
Pennsylvania Pattern.....dis 15 %
Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets.....dis 20 %
Stebbins' Gates.....dis 60 @ 60&10 %
Lincoln's " .....dis 40 @ 40&10 %
Landers, Frary & Clark's Petroleum...dis 10 @ 10&10 %
Taylor's Petroleum Faucets.....dis 20 @ 20&10 %
Brass Liquor Cocks.....dis 20 &10 %
Meat Cutters.—Dixon's .....dis 10 %
Woodruff.....dis 10 %
Stowe.....dis 10 %
Hale's.....dis 25 %
Stuffers.....dis 10 %
Planes.—Auburn Tool Co.. "Bench ".....dis 70&5 %
Second Quality.....dis 40 %
Metallic Plane Co.....dis 25&5 %
Evans Pat. Circular.....net
Plane Irons.—American.....list net
Butcher's.....gold £, $5 50
Picks.—Philadelphia.....net
Pittsburgh.....net
Plumb and Level.
Stanley Rule and Level Co.....dis 60 @ 60&10 %
Wm. Johnson. (Stanley List).....dis 60 @ 60&10 %
Rakes.—Cast Steel Garden.....dis 33⅓ %
Malleable Garden.....dis 33⅓ %
Wood Head Iron Teeth.....dis 30 @ 40 %
Rules.—Stanley Rule and Level Co.....dis 60 @ 60&10 %
Stevens's and Hubbard's.....dis 60 @ 60&10 %
Steelyards.—American Pattern.....dis 15 %

₱ doz..	$5 50	7 00	9 00	1 00	11 00	12 00
No.....	50	100	150	200	250	300

English Pattern.....dis 15 %

₱ doz....	$7 00	8 67	10 67	12 67	14 67	16 67
No.....	50	100	150	200	250	300
L. F. & C. Excelsior.....						dis 10 %
₱ doz....	$9 00	10 00	12 00	15 00	18 00	21 00
No.....	50	100	150	200	250	300

Scythes.—Golden Clipper, Damascus Blade. Boxed and Sharpened.....₱ doz. $11 00 net
Clipper No. 10, Boxed and Sharpened.....₱ doz $10 50
" " 8, " " " 10 00
Common Scythes.....₱ doz $7 00 @ 10 00
Squares.—Steel and Iron, new list.....dis 30 %
Saws.—Diston's Cross Cut.....dis 12½ %
Diston's Hand.....dis 12½ %
W. McNiece's H'd, Cross-Cut & Circ'r, new list..dis 15 %
Boynton's Lightning, new list.....dis 30 %
Shovels and Spades.
Rowland's Plain Back, list Feb. 1873.....dis 20&10 %
" Back Strap " .....dis 20&10 %
Oliver Ames & Sons.....new list dis 12½ %
Brady Shovel Co.....dis 12½&5 %
Sad Irons.—Richmond (polished face) .per lb. 4¼c. net
Coquenock (polished face)..... " 4½c. net
Stone.—Arkansas Oil, No. 1..... ₱ ℔ $1 75
Turkey Oil, No. 1..... " 1 00
Washita Extra..... " 30c
" No. 1..... " 22c
" " 2..... " 18c
Hindostan 8 in..... " 5½c
" Axe..... " 7c
Screws.—Flat..... new list, Jan. 1st, 1874, dis 82½ %
Fine, gimlet-point.....dis 87½ %
Spoons.—
Plated Spoons, Rogers Bros.'...new list dis 30 @ 30&5 %
Britannia. Spoons.....dis 40 @ 40&5 %
German Silver.....new list dis 10 @ 15 %
" Light.....new list dis 15&5 %
Lalance & Grosjean Iron.....dis 10 %
Springs.—Gray's Door.....dis 40 %
Torry's Door.....dis 40 %
Stocks and Dies......dis 15 %
Stove Polish.—Gem.....₱ gross, $5 00
Onyx.....$5 00
Try Squares.—Winterbottom.....dis 10 @ 15 %
Stanley Rule and Level Co.....dis 45&10 %
Willis Thrall, No. 2.....dis 30&10 %
Disston's No. 2.....dis 40 %
Tacks, &c.—Half Weight Tacks.....dis 70 %
" " by the case.....dis 70&7½ %
Clout and Finishing Nails.....7½ %
" " " by the case.....dis 7½ %
Traps.—Genuine Oneida—Newhouse list.....dis 20 %
Imitation " " " .....dis 30 %
Vises.—Solid Box.....₱ ℔ net 15c
Wrenches.—Coes Genuine.....dis 40 %
Coes Imitation Wrought Bar.....dis 50 %
" " Malleable Bar.....dis 60 %
" " (Kellogg) Malleable Bar.....dis 50 @ 10 %
Tafts Pattern (Wrought Bar).....65 %
" " Kellogg's (Nail Bar).....dis 65&10 %
Philadelphia Tool Co.'s Pat. Duplex.....dis 25 %
" " " Improved Baxter.....dis 25 %
" " " Adjustable Fork.....dis 25 %
Wire.—No. 0 to 18.....dis 37½ @ 40 %
No. 19 to 26.....dis 40 @ 42½ %
No. 27 to 36.....dis 45 @ 47½ %
Coppered 0 to 12.....dis 15 @ 20 %
Tinned Broom Wire.....dis 20 %
Galvanized Wire No. 0 to 18.....dis 40 %

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.

July 16, 1874.

Augers—Snell Mfg. Co.....dis 20 %
Bits, Auger—Snell Mfg. Co.....dis 20 %
Bells, Cow—Yaw's Genuine.....dis 25 %
Bolts—Carriage and Tire.....dis 70&20 %
Braces—Bit, Spofford's Patent.....dis 40 %
Brads, Cut.....dis 50&7½ %
Boards—Stove, Brooks' Patent.....dis 30 %
Butts—Brass.....dis 25 %
Cast Loose Joint.....dis 60 %
" " Pin.....dis 45 %
" " " Japanned.....dis 45 %
" " " Silver Tipped.....dis 25 %
Wrought Narrow.....dis 30 %
" Broad, Loose Joint.....dis 35 %
" Table and Back Flaps.....dis 30 %
Wrought Butts, Loose Pin.....dis 35 %
Belting—Rubber.....dis 30 @ 35 %
Leather new list.....dis 30 @ 30&5 %
Beaters, Egg, "Peerless".....per doz $4 00
Brick—Bath (box of 2 doz) Best English.....$1 50
" Rutherford ".....$1 00
Chalk—White, Carpenter s.....₱ gross, 50c
Red, Carpenter's..... " 75c
Blue, " ..... " 90c
Chisels—Firmer Socket.....dis 60&10 %
Framing Socket.....dis 60&10 %
Corner Socket Chisels.....dis 60&10 %
Slick's Carpenters'.....dis 60&10 %
Castings—Malleable.....₱ ℔ 10½c
Cherry Seeders.....per doz $12 00
Elbows—Corrugated.....5 | 5½ | 6 | 7 } dis 10 %
Charcoal.....$3 50 | 4 50 | 5 25 | 6 50 }
Russia.....7 00 | 9 50 | 12 00 | 14 00 }
Files—Malschoss Bros.....dis 50 %
Freezers Ice Cream—" Champion .....dis 33⅓ %
Hammers—Henry W. Kip's.....dis 7½ %
Hinges—Window Blind—
Clark's.....dis 50&5 %
Shepard's and Standard.....dis 50&5 %
Wrought Strap and T.....dis 20&10 %
Hods, Coal—Plain, Black and Galvanized.....dis 10 %
Funnel, Black and Galvanized.....dis 10 %
Fancy and Helmet.....dis 10 %
Palace Coal Vases.....dis 10 %
Hooks and Staples—Wrought.....dis 60&10 %
Hooks—Belt.....dis 50 %
Hasps and Staples—Wrought.....dis 60&10 %
Sad Irons.....4c
Kettles—Brass.....₱ ℔ 50 @ 55c
Enameled.....dis 50 %
Knives, Drawing—Oval No. 1.....dis 60&10 %
Razor Blade.....dis 50&10 %
Lanterns "Peerless," ....No. 1 | 5 | 10
₱ doz $26 00 | $11 25 | $18 75 dis 10 %
Gem, with guards..... $8 50
Tubular..... 11 00
" with Guards..... 11 50
Machines—Apple Paring, "Turn Table".....8 50 ₱ doz
Mills, Coffee—Box and Slide, common.....dis 10 %
Box Union and Eagle.....dis 10 %
" American.....dis 20 %
Nail—Clout and Finishing.....dis 70½ %
Shoe.....dis 75½ %
Horse, Ausable.....No. 5 | 7 | 8 | 9 | 10
30 | 25 | 24 | 23 | 22c
" " Finished & Pointed.....add 1c ₱ ℔
" " 1000 lbs.....dis 5 %
" Clinton.....No. 6 | 7 | 8 | 9 | 10
22 | 20 | 19 | 18 | 17c
Packing—Rubber.....dis 20 @ 35 %
Pencils, Slate—Soapstone.....4 | 5 | 6 dz.
30 | 40 | 50c. ₱ 100
Case lots.....dis 20 %
Paint—White Lead, U. S. Gov't.....₱ ℔ 9 c
Rivets—Iron, Black and Tinned.....dis 20 @ 25 %
Copper.....dis 10 %
Rope—Manila, ¼ inch and larger.....₱ ℔ 15½c
Rules—Boxwood and Ivory, Stephens.....dis 50 %
Screws—"American Screw Co"—
Flat Head, Iron.....dis 52½ %
Flat Head, Brass.....dis 52½ %
Staples—Blind, Boardman s Pat., ¼ & ⅜.....₱ ℔ 87c
Spoons, Iron Tinned.....dis 10 %
" by the case.....dis 20 %
Plated Rogers' A No. 1.....dis 40 %
Britannia.....dis 40 %
Squares—Steel and Iron.....new list 50 %
Shoes, Horse—H. Burden & Sons.....₱ keg $6 00
Shovels & Spades—Shepard, Forsyth & Dennison..dis 20 %
Saws—Henry Disston & Sons.....dis 10 %
Scales—Buffalo Scale Works.....dis 25 %
Fairbanks.....dis 15 %
Shears—Seymour's.....dis 60 %
Traps, Steel—Newhouse.....dis 20 %
Tacks—Half Weight Am. Iron.....dis 72½&7½ %
Vises—Parallel, Buffalo.....dis 20 %
Wrenches—Coes' genuine.....dis 40 %
Coes' Imitation.....dis 50&10 %
Tafts' Pattern.....dis 65&10 %
Ware—French, Tinned and Iron.....dis 25 %
Stamped and Japanned.....net
Cast Iron Hollow.....dis 33⅓ %
Tin Plates.—Add for each X..... 2 50
10x11, IC, Charcoal...$12 50 | 14x20 C, terne...11 25 @ 11 50
12x12, " ... 13 00 | 20x28 C, " ... 22 50
12½x17, " ... 12 6 | 20x28 X, " ... 26 00
14x20, " ... 13 50
Pig Tin—Straits.....31c @ 32c
Bar Tin.....33c
Solder.....No. 1, 17c ; No. 2, 16c
Sheet Zinc—
"Lasalle".....520 ℔ casks
$10 00 | 10 20 ₱ 100 ℔s
Sheet.....$10 00
Iron Wire—Bright and Annealed.....dis 37½ %
Coppered.....dis 32½ %
Tinned.....dis 15 %

Tinned Broom,	Nos. 20	21	22	} dis 20 %
	20c	21c	21c	

Copper—Sheathing 14 @ 15 oz.....₱ ℔ 32c
Planished.....₱ ℔ 39 @ 41c
Bottoms.....₱ ℔ 34c
Bolts.....₱ ℔ 38c
Braziers' Sheets.....₱ ℔ 37c
Sheet Iron.—
18 Common.....$5 00
24 Common.....5 00
24 W. D. Wood & Co., Smooth Finish.....6 10
Am. Russia.....A. | B.
15c | 13½c
Gen. Russia, No. 1 stained.....19c
" " clean.....20c
Galvanized.....dis 15 %

CINCINNATI.

Reported by Sellew & Co., Importers and Jobbers Metals, No. 214, 216 and 218 Main street.

Tin Plate.—I. C. 10x14 Charcoal.....$ @ 13 00
I. X. 10x14 Charcoal..... @ 17 00
I. C. Terne 14x20..... 11 00 @ 12 00
I. C. Terne 20x28..... 25 00 @ 26 00
I. C. Continuous..... 26 00
Block Tin.—
Pigs.....35c
Solder.—
S. & Co.....₱ ℔ 26c
Lead.—Pig.....₱ ℔ 7c.
Copper.—
Ingot.....₱ ℔ @ 7c
Planished.. " @ 44c
Sheathing " @ 35c
Copper Drops @ 35c
Zinc. Cask, 300 to 1000 lbs.....₱ ℔
Case, 100 lbs..... "
Slab.....
Brass.
Roll, No. 6 to 20. ₱ ℔ 30c
" 20 to 28. " 40c
Babbit Metal.—
Sellew & Co.....₱ ℔ 35c
Antimony.....
Bismuth.....
Nickel.....
Bars.....₱ ℔ 36c
A 1.....₱ ℔ 20c
Roofing 23c
Bar.....₱ ℔ 8c
Sheets, 6 to 9 lb...₱ ℔ 41c
" 10 to 12 do... " 38c
Braziers 13 lb..... " 35c
Copper Bottoms .. " —
" " 10 c
" " 11 c
" " 7½c
Roll, No. 28 to 40... ₱ ℔ 50c
Wire, No. 0 to 20... ₱ ℔ 40c
" 20 to 25... " 45c
Allens'.....₱ ℔ 25c
Market..... 12c
₱ ℔ 18c
₱ ℔ 90 00
₱ ℔ 42 50

Sheet Iron.—
Gem Russia.....₱ ℔ 22c
Am Russia A.....₱ ℔ 14c
" " B..... " 11c

	Com. B.	Smooth Fin. S. L. U.	Smooth D Re'fd.
15 to 20	5·2c	6·4c	7·4c
22 to 24	5·4c	6·6c	7·6c
26	5·6c	6·8c	7·8c
27	5·8c	7 c	8 c

Galvanized Iron.—Full bundles.....dis 20 %

Nos. 18 to 20	12c	No. 26	14c
22 to 24	13c	27	15c

Bar Steel.—Silver, ₱ ℔ 16c ; Crescent, 21c.
Iron Wire.....dis 43 %
Enameled Ware.....dis 35 %
One Piece Corrugated Elbows.....dis 10 %

Charcoal Iron.		Russia Iron.	
4½ inch.....	₱ doz $2 60	4½ inch.....	₱ doz $5 00
5 "	" 3 50	5 "	" 7 00
5½ "	" 4 50	5½ "	" 9 50
6 "	" 5 25	6 "	" 12 00
7 "	" 6 50	7 "	" 14 00

Leader Elbows, Flat Crimp Retinned or Galvanized.—Dis. 10 %

	₱ doz.		₱ doz
2-inch.....	$1 75	2½-inch.....	$2 75
3-inch.....	2 25	3½-inch.....	3 25
4-inch.....	2 50	4½-inch.....	3 50

Sheet Iron Bread Pans.....₱ ℔ 10c
American Broilers.....₱ doz. $12 00
Tinner's Machines.....dis 5 %
Sad Irons.....₱ ℔, 4 c
Brass Kettles.—Ansonia.....53c

PITTSBURGH.

The following are the Card rates of Lewis, Oliver & Phillips, H. B. Newhall, 11 Warren St., New York, Agent.

Iron, standard list assorted sizes, for large orders, 2c, card rate, 2 % off net.
Flat Rail (1¼x¼), punched and coun'sunk..4·4c ₱ ℔ net
Iron Wedges.....4¼c ₱ ℔ net
Norway Nail Rods.....9¼c ₱ ℔ net
Crow Bars (in ordering please state whether "Wedge" or "Pinch" point).....5c ₱ ℔ net
Beetle Rings.....8¾c ₱ ℔ net
Fence Pickets—
⅝ round, bent to shape, 80c ₱ ft. of fence, less 15 % off net.

Discount off Standard List.

Carriage and Tire Bolts (new list).....70&10 % off net
Plow Bolts.....30, 10&5 % off net
Stove Bolts.....15 % off net
Machine and Square Head Bolts.....30&10 % off net
Coach and Lag Screws.....30&10 % off net
Bolt Ends.....35 % off net
Pat. Hot Pressed Square and Hexagon Nuts, small sizes, from 3-16 to ⅝ in.....7½c ₱ ℔ off net
Pat. Hot Pressed Square and Hexagon Nuts, large sizes, from 7-16 to 2 in.....6 c ₱ ℔ off net
Washers, all made from new band iron, small sizes, from 3-16 to ⅝ in.....9 c ₱ ℔ off net
Washers, all made from new band iron, large sizes, from 7-16 to 1⅜ in.....7 c ₱ ℔ off net
Nuts and Washers in 25 lb. boxes, 1c ₱ ℔ ex. Nuts and Washers in lots less than one keg each size, 1c ₱ ℔ ex. Nuts and Washers in 5 lb. boxes, 1½c. ₱ ℔ ex.
Harrow Teeth, in lots of 1 ton or more, packed in casks, 1 in. diam. 3¼c ₱ ℔ net ; ⅞ ⅝ in. diam. 3¼c ₱ ℔ net ; ⅝ in. diam. 4c ₱ ℔ net.
Patent Headed Harrow Teeth, packed in casks, ½c ₱ ℔ ex
Skein Bolts, in bulk, in lots of 1 keg or more, ⅝ in. diam. 5½c ₱ ℔ net ; 9-16 in. diam. 6½c ₱ ℔ net ; ½ in. diam. 7½c ₱ ℔ net. 1c ₱ ℔ extra when less than 1 keg of each size is ordered.
Screw Hook-and-Eye Hinges, ⅝ to 1 in. diam. 9c ₱ ℔ net; ⅝ in. diam. 10c ₱ ℔ net; ½ in. diam. 12 c ₱ ℔ net.
Screw and Strap Hinges, in lots of 100 pairs or more, 14 to ⅜ in. long, 5¼c ₱ ℔ net ; 8, 10 & 12 in. long, 6¾c ₱ ℔ net
Strap and T Hinges.....20 & 10 % off net, delivery as customary.
For purchases amounting to $250 between May 30th and December 31st, 5 % extra off.
Screw Hitching Rings.....$5 25 ₱ 100 net
Duck Nest Tuyere Irons.....$14 50 ₱ doz net
Cast Iron Washers.....₱ ℔ 4c net
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 ft. long..... ₱ ℔ 4 c net
1 to 2 in. diam. from 4 to 8 ft. long..... " 4½c net
1 to 2 in. diam. from 1½ to 4 ft. long..... " 4½c net
⅝, ¾ and ⅞ in. diam. over 4 ft. long..... " 4¾c net
⅝, ¾ and ⅞ in. diam. from 1½ to 4 ft. long " 5¼c net
Bridge bolts with upset ends.....¼c. ₱ ℔ extra
Wrought iron plates, punched.....5c. ₱ ℔ net

WAGON HARDWARE.

Wagon Box Strap Bolts—
10 in. long by 7-16 at Screw End, ₱ set of 8 bolts.. 55c
12 " ½ " " 8 " .. 70c
10 " 9-16 " " 8 " .. } 90c
12 " 9-16 " " 8 " .. }
14 " 9-16 " " 8 " .. $1 00
10 " ⅝ " " 8 " .. } 1 00
12 " ⅝ " " 8 " .. }
14 " ⅝ " " 8 " .. 1 10
16 " ⅝ " " 8 " .. 1 20
5c ₱ set for each additional inch over 14 in. All lengths made.
In ordering Box Strap Bolts please give diameter at Screw End.
Wagon Box Rods, narrow track, each.....18c
" " wide track, each.....20c
Single Tree Irons, ₱ set of four pieces.....38c
Wrought Iron Bolster Plates, 2¾ in. wide, ₱ set.....60c
" " 3 " " 65c
" " 3¼ " " 70c
" " 3½ " " 75c
Wagon Brake Ratchets, each.....16½c
" " finished with guard, each..45 c
Wrought Hammer Straps, heavy pattern, each.....16 c
" " light " each.....13½c
" Rub Irons, each.....11 c
Stay Chain Hooks, each.....8 c
Double and Single Tree Clips, figure 1, each.....9 c
" " " 2, each.....10 c
" " " 3, each.....12 c
Strap Bolts, Rods, Single Tree Irons, Bolster Plates, Brake Ratchets, Hammer Straps, Rub Irons, Stay Chain Hooks and Clips, in lots of 50 sets.....dis 25 %
Wagon Box Staples, 1¼ to 2¼ in. to clinch. ₱ 1000 $11 00 net
" " Bevel Box Iron, to rivet on. ₱ 1000 7 50 net
Neck Yoke Eyes, each.....4¾c net
" " with ⅝ rings, each.....7¾c net
King Bolts, ⅞, 1, 1¼, and 1½ in. diam.....₱ ℔ 4½c net
Wagon Rivets, ex. large, flat, oval and steeple head, ¼ in. diam. all lengths..... " 8½c net
Wagon Rivets, 3-16 in. diam., all lengths..... " 9½c net
" " & Nails, in 5 ℔ paper boxes....₱ ℔ 1c extra
" " in 25 ℔ wood " " ½c extra
Wagon and Hinge Nails, ¼ in.....₱ ℔ 17 c net
" " " 3-16 in..... " 19 c net
Double Tree Plates..... " 8½c net
Coupling " ..... " 5½c net
Tongue " ..... " 9 c net
Neck Yoke Plates..... " 11 c net
Tongue Cap Iron, 1¾, 2 & 2¾ in. wide, same price ₱ ℔ as Band Iron.
Wagon Chains, Stay Lock and Tongue, 5-16 in. ₱ ℔ 10½c net. ¼ in., 11½c. net

DETROIT.

(Reported by Messrs. Jewett & Root.)

Tin Plate.—Best Charcoal.....
IC, 10x14.....$12 50
IX, 10x14.....13 75
XX, 10x14.....15 00
IC, 12x12.....13 00
IX, 12x12.....15 75
IC, 14x20.....13 50
IX, 14x20.....16 25
XX, 14x20.....19 00
XXX, 14x20.....21 75
XXXX, 14x20.....24 50
DC, 100 Plate.....12 00
DX, " 14 75
DXX " 17 50
DXXX " 20 25
DXXXX 100 Plate.....23 00
IX, 14x14.....24 50
IC, 10x14 W.....12 00
IX, 10x14 W.....14 75
Roofing Tin.—Best Char.
IC, Terne, 14x20.....$11 50
IX, " 14x20.....14 25
IC, Terne, 20x28.....23 00
IX, " 20x28.....28 50
Coke Tin.—
IC, 10x14 Coke.....$10 50
IX, 10x14, Coke.....13 25
IC, 14x20, " ..... —
Sheet Zinc.—
Any width.....9½c
Copper.—
Sheathing.....33c
Copper Bottoms.....35c
Planished Copper.—
Sheathing, 14x48.....41c
Boiler Size, No. 7.....43c
" " No. 8.....43c
" " No. 9.....43c
Tinning ₱ sheet, 14x48 10c
" " No. 7 10c
" " " 8 14c
" " " 9 16c
Pig Tin.—
Large Pigs.....32c
Small Pigs.....33c
Bars.....30c
Solder.—No. 1.....19c
No. 2.....18c
Bright Wire...dis 37½ %
Sheet Iron.—
No. 18 Am. Com.....5 50
No. 24 Am. Com.....5 50
Pat. Am. Russia "A, Nos. 24, 25 & 26.....14½c
Russia, Nos. 9, 10, 11 & 12..21c
Pat. Planished Russia... c
Russia No. 9, 10, 11&12... c
W. D. WOOD'S & CO.'S SHEET IRON.—
Nos. 15 to 20 Smooth $6 10
" 21 to 24..... 6 50
" 25 & 26..... 6 50
" 21 to 24 Char'l.. 7 00
" 25 & 26 " .. 8 00

A. PARDEE, Hazelton, Pa. J. G. FELL, Phila.

A. PARDEE & CO.,
303 Walnut St.,
PHILADELPHIA
MINERS AND SHIPPERS OF
Lehigh Coals.

The following superior and well-known Lehigh Coals are mined by ourselves, and firms connected with us, viz.

A. Pardee & Co. { HAZLETON. CRANBERRY. SUGAR LOAF
G. B. Markle & Co. { JEDDO. HIGHLAND.
Pardee, Bro. & Co. LATTIMER

OFFICES:
WM. LILLY, Mauch Chunk, Pa.
WM. MERSHON, Agent, 111 Broadway N.Y
WM. H. DAVIS, Agent, Easton, Pa.

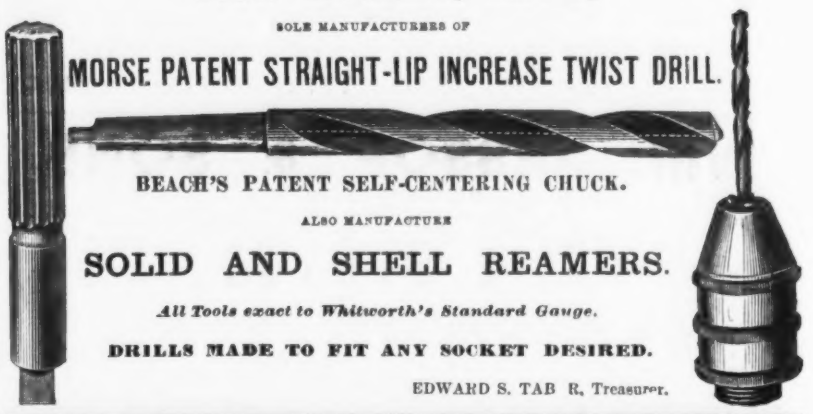
TO ALL WHO USE STEAM-POWER!

We will put our Governor on any Engine, and guarantee it to prove itself superior to all others.

If, after a fair trial, it does not, we will take it off at our own expense.

Shive Governor Co
BETHLEHEM, PA.
ALSO,
SHIVE'S PATENT WATCHMAN'S CLOCK AND DETECTOR.
The Best and Cheapest Watcher of the Watchman made.
PRICE ONLY $15.
Circulars sent free.

Morse Twist Drill and Machine Company,
New Bedford, Mass.,
SOLE MANUFACTURERS OF
MORSE PATENT STRAIGHT-LIP INCREASE TWIST DRILL.



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All Tools exact to Whitworth's Standard Gauge.
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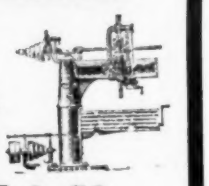

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Wood and Iron Working of every kind. Leather and Rubber Belting, Emery Wheels, Babbitt Metal, &c.
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Best and most perfect Shafting ever made, constantly on hand in large quantities, furnished in any lengths up to 24 feet. Also Patent Coupling and Self-Oiling Adjustable Hangers, Pulleys, &c.
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Of every size and description, constantly hand.
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MEDAL OF HONOUR, SOCIETY OF ARTS & INDUSTRY, LONDON, 1856.

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Warranted Most Superior for Tools and Granite Rock Drills.

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In calling the attention of consumers of Steel in any of the parishes above enumerated, we would respectfully assure them of our ability to supply an article, that cannot be excelled in quality, temper, and adaptation in all respects to the various purposes for which it may be required. Half a century of practical experience in all departments of Steel manufacture, a long established reputation in England, and the Continent of Europe, and in the Eastern States principally of this Country, encourage us to solicit a universal trial of our Steel for the above or other purposes for which a first class material in quality, temper, and durability is needed.

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Particular attention is paid to quality and temper for

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Manufacturers of **Extra Quality Tool**

CAST STEEL,

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All descriptions of **Cast and German**

Spring and Plow Steel,

Elliptic and Side Springs, Seat Springs.

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TIRE, TOE CORK, SLEIGH SHOE, BLISTER & PLOW STEEL.

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A full assortment of "Jenks" Spring Steel in stock.

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PARTICULAR ATTENTION PAID TO THE MANUFACTURE OF STEEL FOR

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FOR LOCOMOTIVES, BOILERS AND FIRE BOXES,

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For Elliptic Springs for Railroad Cars & Locomotives.

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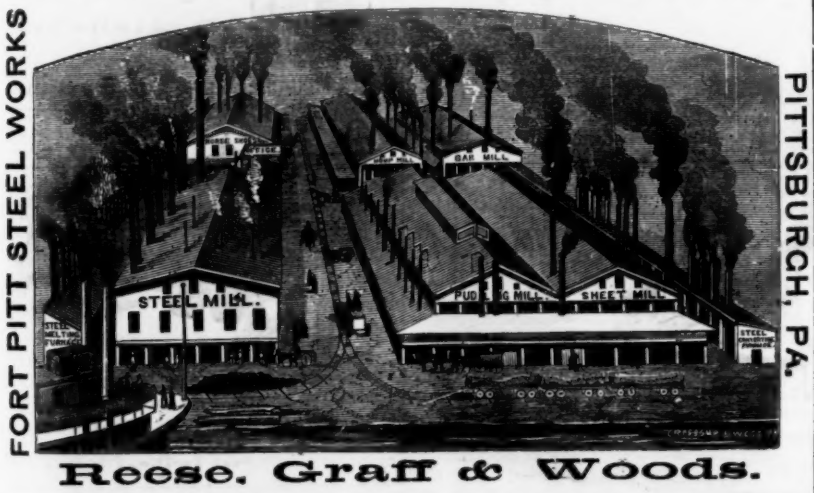

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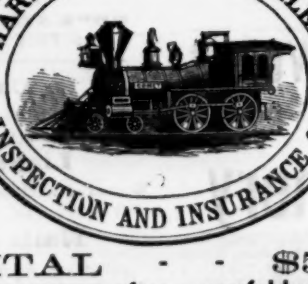

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Scythes—Dunn Edge Tool Co. ..... dis 30 %
Hay and Manure Forks—Otsego extra C. S. ..... dis 30 %
Hoes and Garden Rakes—Jackson and Otsego ..... dis 30 %
Scythe Stones ..... dis 25 %
Scythe and Bush Snathes ..... dis 25 %
Harvest Rakes and Barley Forks ..... dis 25 %
Revolving Horse Rakes ..... dis 25 %
Handles—Fork and Shovel ..... dis 25 %
Cradles—Nithington, Cooley & Co. ..... dis 25 %
—Genuine Morgan ..... ₱ doz net $34 00

Augers and Bits.—
Ives' extra C. S. ..... dis 30 % | Snell's ..... dis 10 %
Jennings' ..... dis 5 % | " Car Bits ..... dis 10 %
Cook's ..... dis 30 % |

Axes.—Amoskeag Yankee ..... ₱ doz $13 50
Amoskeag Crescent ..... " 14 00
Hunt's Bronzed ..... " 13 00
Kennebeck Yankee ..... " 12 00
Lippincott ..... " 13 00
" Crown ..... " 14 00
" Beveled ..... " 14 50
Jefford's Silver Steel ..... " 13 00
Red Warrior, Beveled ..... " 14 00
Kennebeck, Handled ..... " 15 00
Boy's, Handled ..... " 12 00

Bolts.—Carriage and Tire ..... dis 70&20 %
Cast Barrel and Shutter ..... dis 20&10 %
Wrought Iron Barrel ..... add 10 %
" Square ..... net list

Butts.—Cast Fast Joint, Narrow ..... dis 30 %
Cast Fast Joint, Broad ..... dis 20 %
" Loose Joint ..... dis 50&5 %
" " Pin, Reversible ..... dis 40 %
" " Japanned ..... dis 35 %
" " Silver Tipped ..... dis 35 %
Wrought Narrow, Fast Joint ..... dis 30 %
" " Broad " ..... dis 30 %
" " Loose " ..... dis 30 %
" Loose Pin ..... dis 30 %
" Table ..... dis 30 %
" Brass ..... dis 10 %
Garretson's Blind Butts, Wood ..... doz sets $1 75
" " Brick ..... doz sets 2 75
Parker's " Wood ..... doz sets 1 85
" " Brick ..... doz sets 2 75

Casters.—Iron Plate ..... dis 25 %
Brass Wheel Plate ..... dis 25 %
Porcelain Wheel Plate ..... dis 25 %
" " Bed ..... dis 25 %
Iron Wheel Bed ..... dis 25 %

Chisels.—Butcher's Tanged Firmer ..... dis 33 %
" Long Paring ..... dis 30 %
Witherby Socket Framing ..... dis 50&20 %
" " Firmer ..... dis 50&20 %
" " Corner ..... dis 50&20 %
" " Slicks ..... dis 50&20 %

Coffee Mills.
Box 4 Iron ..... $ 3 75 | Box 35 Cast Steel $12 00
" 103 " ..... 5 25 | Side 50 ..... 4 75
" 102 " ..... 6 25 | " 60 ..... 5 75
" 107 Britannia ..... 7 50 | " 70 ..... 7 25
" 106 " ..... 8 50 | " 90 ..... 18 00
" 25 Union ..... 10 50 | " 15 Union 7 00
" 35 " ..... 12 00 | " 20 " 8 00
" 75 Cast Steel .. 10 50 |

Cutlery.—American Table ..... dis 20 %
" Pocket ..... dis 25 %

Door Springs.—Torry ..... ₱ doz $5 00
Rubber ..... " 4 00
Boon's ..... " 5 00

Drawing Knives.—Witherby Tool Co. ..... dis 50&20 %
Ohio Tool Co. ..... net list

Files.—Butcher's ..... $7 00 £
Nicholson's ..... $5 00 @ $5 50 £

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Maydole's ..... net list | Yerks & Plumb ..... net list
| Cheney ..... net list

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Extra Axe ... ₱ doz. $3 00 | Coal Pick, No. 1 .. ₱ doz $2 00
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No. 2 Axe .... " 2 00 | Hatchet ..... " 65
R.R. Pick, No. 1 " 2 00 | Hammer, A. E .. " 65

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Amoskeag Shingling ..... | $7 25 | $8 00 | $8 75
" Claw ..... | 7 75 | 8 50 | 9 22
" Lath ..... | 7 50 | 8 25 |
" Solid Steel ..... | | | 12 00

Hinges.—Strap and T ..... dis 20&10%
Screw Hook and Strap, 6 to 12 in ..... net, 9c. ₱ lb
" " 14 to 24 in ..... net, 7½c. ₱ lb
Hook and Eye Hinges ..... net 12c. @ 16c. ₱ lb
Gate, No. 35, State ..... ₱ doz $3 50
" No. 3, In and Out ..... " 3 50
" Blinn's Pat ..... " 7 50

Hog Ringers.—Hill's Patent ..... ₱ doz $6 00
Hill's Patent Rings ..... ₱ 100, 25c
" Tongs ..... ₱ doz $5 00

Horse Nails.—Northwestern, 8d 24c
Ausable, 8d 24c
Globe, 8d 26c

Kettles.—Brass 54c

Locks and Knobs.—
Norwalk Lock Co. dis 45 % | Enameled ..... dis 30 %
Branford " ... dis 45 % | EagleLock Co ..... dis 15 %
| Am. Pad Locks ..... dis 35 %
| Cont'l'al Lock Co ... dis 10 %
| Woodruff Patent ... net list
| Stowe's Sausage Stuffers ..... net list
| Enterprise Patent ... dis 5 %

Measures.—
Stebbin's Patent .. dis 50 %

Nails.—10d to 60d ..... per keg $4 00

Oil Stones.—Washita No. 1 ..... net 30c ₱ lb
Washita Slips ..... net 60c "
Hindostan No. 1 ..... net 9c "
" Axe ..... net 10c "
" Slips ..... net 15c "

Picks and Mattocks.—Picks, Railroad, Axe Finish ..... ₱ doz $12 00
Picks, Coal, Axe Finish ..... " 10 00
Mattocks, L. C., Axe Finish ..... " 15 00
" S. C. " ..... " 14 50
Grub Hoes, Axe Finish, No. 2 ..... 1 00

Planes.—Ohio Tool Co., Bench ..... dis 30 %
Sciota ..... dis 35 %
A. Howland & Co., Bench ..... dis 50 %
" Fancy ..... dis
Bailey Patent Iron ..... dis 15 %
Plane Irons, Butcher's ..... dis 30 %

Rivets.—Iron, dis 10 @ 15 % | Copper, No. 7, net, ₱ lb, 50c
Tinned ..... dis 10 @ 15 % |

Rules.—Stanley Rule and Level Co ..... dis 50&10 %
Hubbard & Curtiss Mfg. Co ..... dis 50&10 %

Sad Irons.—Best A No. 1 ..... ₱ lb. 4c
" Copper Face Star ..... ₱ lb. 4½c

Sandpaper.
Baeder & Adamson's No. 0 to 1½ ... per ream, net $4 50
" " No. 2 to 3 ..... " net 5 00
Wiggins & Stevens, No. 0 to 1½ ..... ₱ ream, net, $4 50
" " No. 2 to 3 ..... " " 5 00

Sash Locks.—Champion ..... ₱ gross, net, $12 00
Hopkins & Dickinson ..... dis 10 %
Judd's Patent ..... dis 10 %
Corbin's Patent ..... dis 10 %
Clark's Patent ..... dis 20 %

Saws.—H. Disston & Sons ..... dis 10 %
Champion X Cut ..... ₱ foot, net, 60c
M. A. & Co. X Cut ..... " " 50c
Lightning Cut ..... " " 66c

Screws.—American Screw Co.—Iron ... new list dis 30 %
American Screw Co.—Brass ..... dis 50 %

Shovels and Spades.
Ames' Black Shovels ..... ₱ doz $14 50
" Polished " ..... " 15 50
" Patent " ..... " 18 00
Ailing " ..... " 16 00
" " Molders' ..... " 18 00
Crane's Black " ..... " 11 50
" Polished " ..... " 12 00
Smith's " B. S. L. H. Rd. Pt. ... " 13 50
" " B. S. D. H. Rd. Pt. ... " 14 00
Ames' Black Spades ..... " 16 00
" Polished " ..... " 17 00
" Patent " ..... " 17 50
Ailing " ..... " 16 00
Crane's Black " ..... " 12 50
" Polish'd " ..... " 13 50

Scoops.—Ailing Steel Polished, No. 2 ..... ₱ doz, $13 50
Ailing Steeled Polished, No. 3 ..... " 14 00
" " No. 4 ..... " 14 50
" " No. 5 ..... " 15 50
" " No. 6 ..... " 16 50
" " No. 7 ..... " 17 50
" " No. 8 ..... " 18 50
" " No. 10 ..... " 21 50
Crane's Polished, No. 5 ..... " 13 50
" No. 6 ..... " 14 50
" No. 7 ..... " 15 50
" No. 8 ..... " 16 50
Crane's Black Coal, No. 4 ..... " 17 50
" No. 5 ..... " 18 00
Preston, Black Scoops No. 1 ..... " 12 00
" " No. 2 ..... " 12 50
" " No. 3 ..... " 13 00
" Half Pol. Scoops No. 1 ..... " 12 50
" " No. 2 ..... " 13 50
" " No. 3 ..... " 14 50
Lippincott, Half Pol. No. 2 ..... " 15 00
" " No. 3 ..... " 16 00

Wrenches.—Taft's ..... dis 60 %
Coe's Imitation ..... dis 50 %
Coe's Genuine ..... dis 30 %

Wringers.—Novelty Clothes Wringer ..... ₱ doz $69 00
Universal Clothes Wringer ..... " 69 00

Chicago Metal Market.

(Reported by Cragin Bros. & Chandler, 141, 143, and 145 Lake St.)

Tin Plate.—
IC, 20x14, Coke $11 50
IC, 10x14, Charcoal 12 50
IX, 10x14 " 15 50
IC, 12x12, " 13 00
IX, 14x12, " 16 00
IC, 14x20, " 13 50
IX 14x24, " 16 50
IXX, 14x20, " 19 50
IC, 14x20, Coke Roofing 19 50
IC, 10x20 Coke, for Gutters 12 00
IC, 14x20, Charcoal Roofing 15 00
IX, 14x20 " 25 00
IC, 20x28, " 30 00
IX, 20x28, " 30 00

Pig Tin.—
Large, 60 ₱ ..... 30c | Bar Tin 32c

Zinc.—
In casks 1000 ₱s ..... c | In sheets ..... 11 c
" 500 " ..... 10¾c | Slab 9c

Copper.—Copper Bottoms 35c
Sheathing Copper 34c
Planished Copper 41c
" cut to lengths 46c

IXXX, 14x20, " 22 50
IXXXX, 14x20, " 25 50
IX, 14x14, " 27 00
DC, 100 Plate, " 12 50
DX, " 15 50
DXX, " 18 50
DXXX, " 21 50

Braziers' Sheets, 30x60.—8 to 9 lbs ..... 41 c
10 and 12 lbs 38c
Solder.—Extra Fine, C. B. & Co.'s Brand 25c
Fine, No. 1 ..... 22c
Antimony 20c
Babbit Metal ..... 15c @ 25c.
Galvanized Iron Conductor Pipe ..... ₱ ft 10c
Sheet Iron.— Common. Smooth. Charcoal.
No. 14 to 24 ..... 5 c 6½c 8 c
25 & 26 ..... 5½c 7 c 8½c
27 ..... 6 c 7½c 9 c
Add ½c ₱ lb for 30 in. wide.
Galvanized Iron ..... dis 15 %
No. 16 to 20 ..... 12c | No. 27 ..... 15c
21 to 24 ..... 13c | 28 ..... 16c
25 & 26 ..... 14c |
Russia Iron.— | No. 1 Stained 20c
Perfect ..... 22c | In Sheets, 1c. higher.
American Russia.— | Bands 11c
A ..... 15c | In sheets, 1c higher.
Lead.— | Lead Pipe, in full coils 10 c
Pig ..... 8 c | Lead Pipe, when cut. 10½c
Bar ..... 9½c | Sheet Lead 10½c

BOSTON.

(Reported by Macomber, Bigelow & Dowse, 156 to 164 Oliver St.)

Apple Parers.—Reading ..... per doz $8 00
Augers.—Watrous Ship ..... dis 10 %
L'Hommedieu Ship ..... dis 15 %
Axes.—Forester's Favorite, Bronzed $12 50
Blue Jackets, Blue 12 00
Excelsior, Black 11 50
Chopper's Pride, Bronzed 11 00
Red Cross, Red 10 50
Red Cross, Handled 13 50
Boy's Handled Blue Jackets 12 00
Axe Handles.—Wadleigh's Oak—
A (Extra) $2·50. B (No. 1) $2·00. C (No. 2) $1·50 ₱ doz
Blind Hinges.—Washburn's ..... per hundred set $9 50
Blind Pasts.—Washburn's ..... per hundred set $5 75
Bolts.—Carriage, Phila., "Girard Works ..... dis 50&5 %
Borax.—Best Refined ..... ₱ lb 16c
Borers.—Angle, Backus ..... dis 30 %
Boring Machines.—Angle ..... each $4 75
Common, Snell's quality ..... each 3 75
Braces.—Barber's ..... dis 40&5 %
Backus' ..... dis 50 %
Spofford's ..... dis 40 %
Brass Faucets.—L. F. & C ..... dis 25&10 %
Butts.—Union Drilled Loose Joint ..... dis 60 %
" " Wire Fast Joint ..... dis 50 %
" " Acorn Loose Joint ... dis 50&10 %
Brass Butts ..... dis 30 %
Wrought Table Butts and Back Flaps ..... dis 30 %
Wrought Narrow Butts ..... dis 30 %
Cartridges.—"U. S. Cartridge Co." ..... dis 50 %
Chisels.—"Buck Bros.' Shank Goods ... add 20 @ 22½ %
Sockets ..... add 22½ @ 25 %
Compasses and Dividers.—Bemis' ..... dis 35 %
P. S. & W ..... dis 25 %
Cordage.—Manila (usual trade dis.) ..... ₱ lb., 16c
American Tarred Hemp Lath Yarn ..... ₱ lb., 10c
Corn Hooks ..... per doz $2·75
Crow Bars.—Iron. Steel Points ..... ₱ lb., 5¾c
"Sweet" Steel Bars ..... ₱ lb 11c
Brown's Steel Bars ..... ₱ lb 10c
K. P. & Co. Extra Drill Steel ..... ₱ lb 15c
Dividers.—Cook's Nickel Plated ..... dis 15 %
Door Springs.—Stimson's Patent.—
No. 1, Light Inside doors, $12·00 ..... dis 25 %
No. 3, " outside " $18·00 ..... dis 25 %
Torrey's ..... $4·00
Emery.—Aldens ..... ₱ lb 7c
Wellington Mills ..... ₱ lb 10c
Files.—Earl Smith & Co.'s English ..... $5 to £ gold
American ..... $5 to £ currency, less 10 %
Nicholson ..... $5 to £ currency, less 1½ %
" Regular Taper ..... dis 12½&5 %
Stubb's Tapers, genuine, 8 in., $1·30; 3½, $1·02; 1, $1·88; 4½, $2·13; 5, $2·50.
Funnel Irons.—$2·50 2·50 2·50 3·25 per doz
5, 5½, 6, 7 inch.
Deep Flange.—$3·50 3·50 4·00
5, 5½, 6 inch.
Hammers.—Maydole, new reduced list, July 1st, 1874 ..... dis 5 %
M., B. & D., solid cast steel, adze eye, No. 1, $10; 1½, $5·25
" " " " " bell face, No. 1, $11: 1½, $9·75.
Hangers & Rollers.—Novelty ..... dis 30 %
Anti-Friction ..... $1·75 per pair—dis 30 %
Hatchets.—Underhill Edge Tool Co ..... dis 10 %
Underhill pattern, solid, C. S. lathing $9 00
Underhill Bros. pattern, solid C. S. Lathing 10 00
C. F. Dowse, warranted Cast Steel—
Shingling ..... 0, $4·75; 1, $5·25; 2, $5·75
Claw ..... 1, 5·75; 2, 6·25
Lathing ..... 1, $5·50
Axe Pattern ..... 1, $7·00; 2, 7·50
Broad ... 0, $5·75; 1, $6·50; 2, $7·00; 3, $9·25; 4, $10·75; 5, $12·75; 6, $14·75.
Hinges.—Strap and T, Stanley Works ..... dis 20&10 %
Plate, Loose and Fast Joint ..... ₱ lb 7½c
Wrought Screw Hook ..... ₱ lb 8c
Hoes.—Ely Balch & Co. M., B. & D.'s list, 1874 ... dis 25 %
Remington, M., B. & D.'s list, 1874 ..... dis 30 %
Lead.—Sheet and Pipe ..... 8c—dis 10 %
Locks.—P. & F. Corbin ..... new list dis 45&5 %
Nashua ..... dis 45&5 %
Manure Forks.—
Myers & Ervien, M., B. & D.'s list, 1874 ..... dis 25 %
Peck, Clark & Co., " " ..... dis 25 %
Shumway & Co.. " " ..... dis 30 %
Mattocks.—K. P. & Co., axe finish, long cutter .. $13 75
Short cutter 13 50
Metal.—Babbitt. No. 1, 35c; 2, 25c; 3, 16c; 4, 15c ₱ lb
Nails.—10c. and larger $4 00
Padlocks.—Wilcox ..... dis 50&2 %
All Brass, 2½ inch, 2 keys, job lot $9 00
Picks.—K. P. & Co., Polished Points—
5 to 6 ..... per doz $9 00; 6 to 7, $9 50
Pins.—Universal Hat and Coat—
All wood, 2 in ..... ₱ gross $2 50; 3 in., 3 50; 4 in., 4 50
Potato Digger.—
"Partridge," 6 square tine ..... ₱ doz $12 00
Shumway & Co., 6 round tine ..... ₱ doz 9 00
Pulleys.—Clark & Co.'s Axle, 2 in ..... per doz 42c
Plated Ware.—Rogers Bros ..... new list dis 40 %
Plumb & Levels.—"Darn" Pat. Adjustable—
No. 1, Iron and Wood Center Levels ..... dis 50 %
No. 2, First Quality Levels ..... dis 60&10 %
No. 3, Iron Pocket " ..... dis 35 %
No. 4, Level and Plumb Glasses ..... dis 60&10 %
No. 5, Iron Pocket Levels, per square and straight edge ..... dis 50&10 %
No. 6, Improved Iron Bench Planes ..... dis 20&10 %
Pocket Knives.—Conn. Cutlery Co ..... new net list
Rakes.—Cast Steel, garden ..... dis 30 %
Malleable ..... dis 25 %
Rail Road Door.—For Novelty and Anti-Friction Hangers ..... per foot 7c., dis 10 %
Rivets.—Black ..... dis 25 %
Carriage, oval head, Nos. 3, 4, 5, 6, 7, 8.
13 13 14 14 15 16c ₱ lb net
Sad Irons.—Bliss & Drake ..... ₱ lb 4½
Sand Paper.—0 to 2, $4·25; 2 to 3, $4·75..new list dis 10 %
Saws.—Disston's ..... dis 12½ %
Lightning A cut, Boynton's ..... per foot 6½c
" Saw Blades, 32 inch ..... per doz $7 00
" Framed Saws ..... per doz 8 50
Common " ..... per doz 6 00
Disston " " ..... per doz 9 00
One man X cut.—Lightning ..... $2 75 each
Disston's $3·00 each ..... dis 12½ %
Wheeler, Madden & Clemson ..... dis 15 %
" " " Mill ..... dis 25 %
" " " Circular ..... dis 25 %
Screws.—American Screw Co ..... revised list dis 62½ %
Scythe Stones.—
"Willoughby Lake," first quality ..... ₱ gross $6·50
" " second quality ..... 3·00
Shovels.—O. Ames ..... new list dis 12½ %
M. B. & D ..... new list dis 12½ %
Spading Forks.—M. & E ..... dis 25 %
Stone Pickers.—"Partridge," original ... ₱ doz $15 00
Tools.—Aiken's Pattern, 20 in set; Miller's Falls, $12·00 per doz ..... dis 15 %
Traps.—Oneida ..... dis 20 %
Blake's ..... dis 20&5 %
Vises.—K. P. & Co.'s Solid Box, Blacksmith ... ₱ lb 14½c
Parker's Parallel ..... dis 10 %
Backus ..... dis 25 %
"Howards," Parallel ..... dis 20 %
Wardrobe Hooks.—Wire to drive ..... ₱ gross $1 00
Weights.—Window Weights ..... ₱ lb 2½c
Wire Netting.—Clinton Wire Cloth Co., Green, Drab or Black ..... ₱ ft 6c
Wrenches.—Genuine Wrenches, A. G. Coes .. dis 40&5 %
Wringers.—
Novelty and Universal } Tub No. 2 } ..... per doz $67 00
Novelty Bench, No. 4 ..... per doz 104 00
Eureka ..... per doz $60 00

Boston Metal Market.

(Corrected by Fuller, Dana & Fitz.)

Tin Plates.— ₱ box
I. C. Char. 10x14 @ $11 00
I. C. Coke 10x14 .. 10 50
Char. Roof. IC, 14x20. 12 00
Coke " IC, 14x20. 11 00

Pig Tin.— ₱ lb
Banca 33c
Straits 33c
English 26c

Zinc.—Sheet ..... ₱ lb 10c

Copper.— ₱ lb
Sheathing 33c
Bolt 35c
Ingot 26c

Lead.— ₱ lb
Pig 7½c
Sheet and Pipe ... 7·2c

Spelter ..... ₱ lb 9c
Antimony ..... ₱ lb 16c

Iron.—Sheet Iron, Russia ..... " 19c
Sheet Iron, English ..... " 5½c
" " American Refined ..... " 6½c
" " Galvanized ..... " 11c
Plate Iron ..... " 4
Swedish and Norway Bar Iron, gold ..... ₱ ton, $132 50
" " " Shapes, gold 135 00
Norway Nail Rods, first quality, gold 157 50
" " second " " 140 00
Best Refined Bar Iron 67 50
The "Burden Best" Iron 112 00
American Pig Iron, Foundry, No. 1, x ... 36 00 @ 37 00
" " No. 2, x ... 34 00 @ 35 00
" " Gray Forge 30 00
Scotch Pig Iron ..... ₱ ton 39 00 @ 42 50
Wrought Scrap Iron 38 00

Steel.— ₱ lb
Eng. Tool 18c
American Tool 15c
" Mach 10½c
Passemer 7½c
German 10½c
Spring 7½c
Tire ..... 7 c
Sleigh Shoe 5½c
Toe Calk 7½c

ST. LOUIS.

Corrected weekly by Semple, Birge & Co

Anvils.—Armitage ..... ₱ lb, gold 13c
Peter Wright's ..... " 11c
Wilkinson's ..... " 12½c
Apple Parers.—Conqueror ..... ₱ doz, $9 00
Lightning 9 00
Turn Table 9 00
Axes.—Hunt's ..... ₱ doz $13 00 @ 13 50
Lippincott's ..... " 12 00 @ 13 00
Lippincott's Pioneer ..... 13 00 @ 13 50
Simmons' ..... " 12 00 @ 13 00
Axles.—Kritch & Crane Mfg. Co.'s—
Patent Taper Axles ..... new list net
Swelled Taper Axles ..... new list net
Concord Axles ..... new list net
Red Jacket Axles ..... new list net
Common Axles, 1½ inch and upward ..... ₱ lb 8½c
" " less than 1½ inch ..... " 8½c
Bellows.—"Best St. Louis make" 60c ₱ in. dis 20 %
Bells.—Troy, Church ..... ₱ lb, 50c
Light Brass, Hand ..... dis 50 %
Moore's, Cow ..... dis 20 %
Bolts.—Arms, Bell & Co.'s Machine ..... dis 20 %
Arms, Bell & Co.'s Carriage and Tire ..... d's 75&5 %
Cast Butt Hinges.—Western Butt Co.'s—
Narrow Fast Joint ..... dis 35 %
Broad Fast Joint ..... dis 50 %
" Loose " ..... dis 60 %
Reversible ..... dis 50 %
" Japanned and Silver Tipped ..... dis 45 %
Loose Joint "Acorn" " " ..... dis 55 %
Lull & Porter's Blind ..... dis 50 %
Wrought Butts.—Narrow ..... dis 25 %
Reversible ..... dis 30 %
Broad ..... dis 30 %
Chain.—Eng. Coil. 3-16 ¼ 5-16 ⅜ 7-16 ½ in.
15 11 10 9½ 9 8c gold
Trace ..... 6½-10-2 7c "
7-10-2 7½c "
German Coil and Halter ..... revised list add 10 %
Chisels.—Socket, Firmer or Framing ..... dis 60 %
Clothes Wringers.—Crown ..... ₱ doz $60 00
Novelty ..... " 69 00
Universal ..... " 69 00
Monitor ..... " 69 00
Corn Cutters or Hooks.—Solid Steel ... ₱ doz $1 50
Corn Knives.—Dunn E'ge T'ol Co.'s Clip .. ₱ doz $5 75
Disston's ..... " 6 00
Crow Bars.—Steel Pointed ..... ₱ lb 7c
Cutlery.—J. Russell & Co.'s ..... } new list, dis 15 %
Lamson, Goodnow & Co.'s ..... }
Landers, Frary & Clark's ..... }
Files and Rasps.—
Nicholson's Files ..... $5 00 less 5 %
Butcher's Mill $6 75
Heller's & Bros Horse Rasps ..... dis 40 %
Forks and Hoes.—
Auburn Mfg. Co.'s Hay and Manure Forks ..... dis 20 %
" " Handled Hoes ..... dis 30 %
" " Planter Eye Hoes ..... add 15 %
Winsted's Planter Eye Hoes ..... add 15 %
Hammers.—Yerkes & Plumb ..... dis 5 %
Masons' Hammers ..... ₱ lb 20c
Smith Hand Hammers ..... " 23c
Handles.—Axe ..... Extra. $2·75 | No. 1. $2·25 | No. 2. $1·75 | No. 3 $1·00
Pick ..... Extra. $2·50 | No. 1. $2·00 | No. 1½. $1·75 | No. 2 $1·25
Smith & Montrose Fork, Hoe and Rake ..... dis 20 %
Harrow Teeth.—1 inch iron ..... ₱ lb 4½c
⅞ and ¾ inch iron 4¾c
⅝ inch iron ..... " c
Barbed or Headed ..... ½c extra
Hatchets.—Hunt's ..... dis 10 %
Simmons' ..... dis 15 %
Hay Knives.—Lightning ..... ₱ doz $20 00
Dunn Edge Tool Co.'s ..... ₱ doz $14 50—dis 15 %
Fisher's ..... " 16 50—dis 10 %
Hinges.—Strap and T—St. Louis make ..... dis 25 %
Horse Nails.—Ausable ..... 22c rates
Northwestern ..... 22c "
National Patent Pointed ..... 21c "
" Extra Finished ..... 22c "
Horse Shoes.—B. I. (Perkin's pat ..... ₱ keg $6 5
Burden's ..... " 6 50
Mule Shoes ..... " 7 50
Rhode Island Trotting Shoes ..... " 9 00
Lawn Mowers.—"Hill's Archimedean" ..... dis 20
"Excelsior" ..... dis 25 %
"Star" ..... dis 30 %
Locks and Latches.—
Jones & Nimick's ..... revised list dis 40 %
Moorhead, Adams & Co ..... revised list dis 40 %
Norwalk Lock Co.'s ..... revised list dis 40 %
Mattocks and Grub Hoes.—
Klein, Logan & Co.'s Mattock's ... ₱ doz. $14 75 @ 15 25
" Grub Hoes, Oval Eye ... ₱ doz. 10 75 @ 12 00
Nails.—Wheeling ..... $3 75 rates
Orders for 100 kegs 10c ₱ keg less.
Picks.—Klein, Logan & Co.'s R. R. and Clay ₱ doz. $11 00
Klein, Logan & Co.'s Coal ..... " 8 50
" " Poll ..... "
" " Stone ..... " 14 50
" " Tamping ..... " 17 00
Planes.—Ohio Tool Co.'s ..... dis 30 %
Sciota ..... dis 40 %
Post Hole Augers.—Clark's Patent—
No. 1, ₱ doz. $27; No. 2, $30; No. 3, $32 ..... dis 20 %
Barton's Patent ..... ₱ doz $25—dis 20 %
Vaughn's " ..... " 25—dis 10 %
Sad Irons.—Monitor Brand, Silver Polished ... ₱ lb 4c
Sash Weights.—Standard Solid Eyes ..... ₱ lb 3¾c
Saws.—Disston's ..... dis 10 %
Hubbard, Lippincott, B. & Co.'s ..... dis 10 %
Branch, Crooks & Co.'s ..... dis 15 %
Livingston's Patent Buck ..... net list
Screws.—American Screw Co.'s revised list ... dis 50 %
Scythes.—
Dunn Edge Tool Co.'s ..... new list dis 25 %
Paris Furnace Co.'s ..... dis 30 %
Scythe Stones.—No. 1 Ind'n Pond ₱ gr's, $7 00
Extra Indian Pond ..... " 7 50 } dis 25 %
Premium ..... " 9 50 }
Diamond Grit ..... " 13 50 }
Shovels, Spades and Scoops.—
Ames' ..... dis 7½ %
Lippincott's ..... dis 20 %
Rowland's Maxwell ..... revised list dis 15 %
Sledges.—Smith's Stone or Coal Sledges—
Steel Face Polished ..... ₱ lb, 15c
Solid Cast Steel ..... " 12c
Snaths and Cradles.—Seymour Mfg. Co.'s .. dis 25 %
Springs.—Cleveland Spring Co.'s—
Carriage and Express ..... dis 20 %
Blue Seat Springs ..... new list dis 15 %
Tacks.—Norway Tack Co.'s ½ weight ..... dis 72½ %
Brads ½ weight ..... dis 50 %
Thimble Skeins.—Pump & Skein Co.'s .. dis 50&40 %
Traps.—Newhouse Patent ..... dis 15 %
Vises.—Solid Box ..... ₱ lb 16c
Wilson Mfg. Co.'s ..... dis 15 %
Wrenches.—Coes' Genuine ..... dis 33½ %
Coes' Pattern ..... dis 10 %
Taft's ..... dis 60 %

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sellew & Co.

Tin Plate.
IC, 10x14, Charcoal ... $12 50 | IC, continuous, 20 in. x 300 ft.
IX, 10x14, " ... 15 50 | IX, continuous, 20 in. x 300 ft.
IC, 12x12, " ... 13 00 | IC, 10x14, best Coke ... $11 50
IX, 12x12, " ... 16 00 | IC, 10x14, good " ... 11 00
IC, 14x20, " ... 13 50 | IC, 10x20 ..... 19 00
IC, 14x20, Terne ..... 12 00 | IX, 14x20 ..... 11 50
IX, 14x20, " ..... 14 50 | IC, 20x28 ..... 9 50
IC, 20x28, " ..... 25 00 | IX, 10x14, Coke Lead.
IX 20x28, Terne ..... 30 00 | IC, 10x14, punch'd for Safes 10 00

Block Tin.
Large Pigs ..... 30c | Bars 32c
Small " ..... 31c |

Sheet Zinc.
Casks ..... ₱ lb 10 c | Sheet ..... ₱ lb 11c

Solder.
No. 1, Refined, in bars or plate 20c
No. 2, " " " 18c
Pig Lead 7¼c

Sheet Copper.—18 to 100 lbs. Sheets 30x60 ..... 35c
14 to 16 lbs., Sheets 30x60 ..... 35c
10 to 12 lbs., " and 30x72 ..... 38c
6 to 9 lbs., " 41c
Tinned, 14 and 16 oz. 14x48 ..... 34c
Planished, 14 and 16 oz. 14x48 ..... 41c
" No. 7, 8 and 9 ..... 45c
Copper Bottoms ..... ₱ c

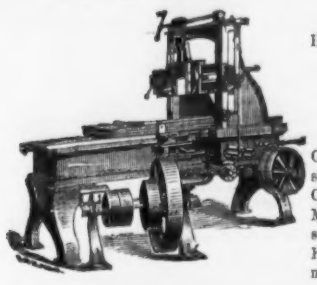
Sheet Iron.—

	Com'n.	Sm'th.	Char'l.	Jun'la
No. 16 to 20	5c	6c	8c	10c
No. 22 to 24	5c	6c	8c	10c
No. 26	5¼c	6¼c	8¼c	10¼c
No. 27	5½c	6½c	8½c	10½c

Galvanized Iron ..... dis 15 %
Iron Rivets ..... dis 20 %
Iron Wire ..... dis 30 %
Coppered Market Wire

The Pratt & Whitney Co.,

Hartford, Conn.,



Have constantly on hand and making

Drop Hammers

Of recently Improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Broaching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Make to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c., &c.

RICHARD DUDGEON,

No. 24 Columbia Street, New York,

MAKER AND PATENTEE OF

Hydraulic Jacks and Punches,

ROLLER TUBE EXPANDERS

And Direct-Acting Steam Hammers.

Communications by letter will receive prompt attention.

ACKS for Pressing on Car Wheels or CRANK PINS made to order.

The "EMPIRE" Fan Blowing Portable Forges,

With or without Hood.

(Patented Nov. 25, 1873.)

WITHOUT BELTS OR BELLOWS.

It is more **Easily Worked, gives a Better Blast,** and is the **Cheapest** Forge made.

☞ **IT HAS NO BACK DRAUGHT.**

Manufactured by W. P. KELLOGG & CO., Troy, N. Y.

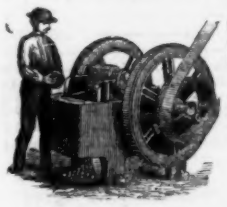
Also **Curry Combs, Boring Machines, & Cooley's Whip Racks, etc**

N. Y. Depot for **Curry Combs, &c.,** with F. WIEBUSCH, 84 Chambers Street.

N. Y. Depot for **Forges,** with GEO. PLACE & CO., 121 Chambers & 103 Reade Streets.

BLAKE'S PATENT STONE & ORE BREAKER.

New Pattern with Important Improvements & Abundant Strength



For reducing to fragments all kinds o hard and brittle substances, such as STONE for making the most perfect McADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS. It is extensively in use in MINING operations, for crushing

IRON, COPPER, ZINC, SILVER, GOLD, and other ORES.

Also for crushing **Quartz, Flint, Emery, Corundum, Feldspar, Coal, Barytes, Manganese, Phosphate Rock, Plaster, Soapstone, &c.**

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BLAKE CRUSHER CO., New Haven, Conn.

Persons visiting New York, can be shown a crusher in operation at 127 Elm St

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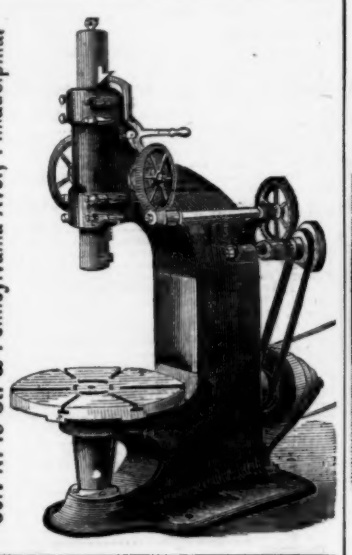
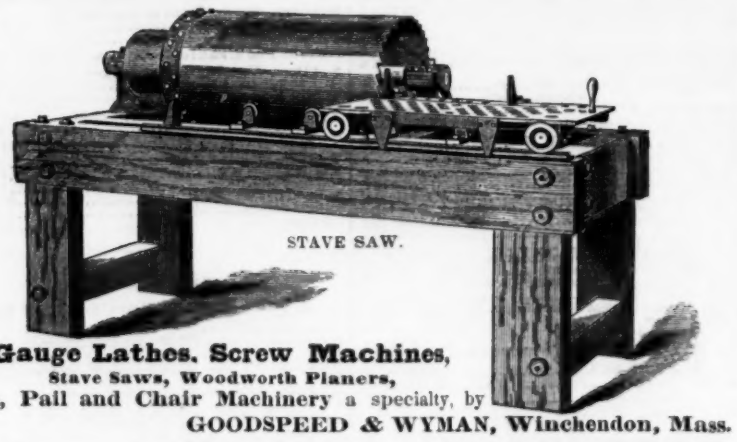
E. HARRINGTON & SON, Manufacturer of **ENGINE LATHES,** from twelve (12) to forty-eight (48) inches swing; **Hand Lathes; Wood Turning Lathes; Vertical Drills; Boring Mills; Tapping and Centering Machines; Screw Press,** for Mandrels; **Grindstone Boxes.**

Cor. N. 15 St. & Pennsylvania Ave., Philadelphia.





STAVE SAW.

Gauge Lathes, Screw Machines,

Stave Saws, Woodworth Planers,

Tub, Pail and Chair Machinery a specialty, by

GOODSPEED & WYMAN, Winchendon, Mass.

CORLISS STEAM ENGINE.

The Best in the World for Economy in Fuel and Cost of Running.

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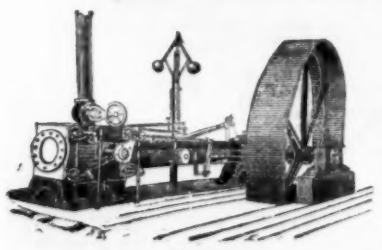

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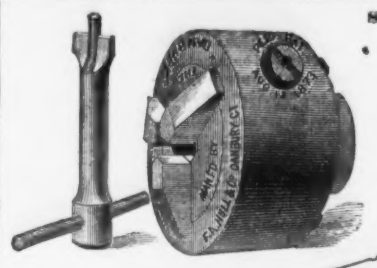
Chester, Pa.,

Engineers, Machinists, Founders,

And BOILER MAKERS.

Stationary Engines, Shafting, Mill Gearing, Hoisting Machines, Improved Piston Packing and Machinery.

Special attention given to Boring Ports and Cylinders.



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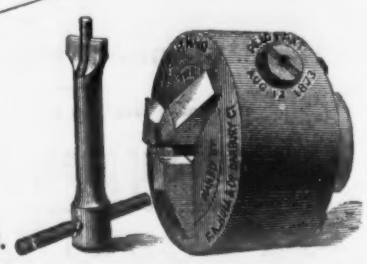
The "Danbury" Universal Drill Chuck.

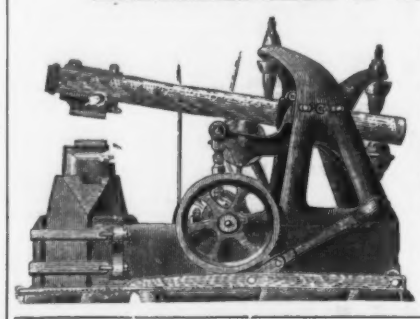
Not equalled in any essential. Only Chuck holding drills from ¼ down to 0. Runs *true* on all sizes, and will never slip or "set."

F. A. HULL & CO., Manufacturers, Danbury, Conn.



C. H. Reid's Patent, Aug. 12th, 1873.

BRADLEY'S CUSHIONED HAMMER.



This Hammer has many valuable improvements made useful in the device for cushioning the blow, thereby relieving all the working parts from that jar and concussion which is the destroying element of other Helve Hammers. It is made Adjustable in Line of Action, Length of Stroke, Rapidity of Motion, and Weight of Blow, all of which are controlled at the will of the operator. They have ***Larger Capacity, Cost Less,*** are more ***Durable,*** take up ***Less Room,*** do ***More*** and ***Better Work*** at ***Less Expense*** for Power, than any other Hammer in use. We guarantee them fully as recommended. For particulars, address

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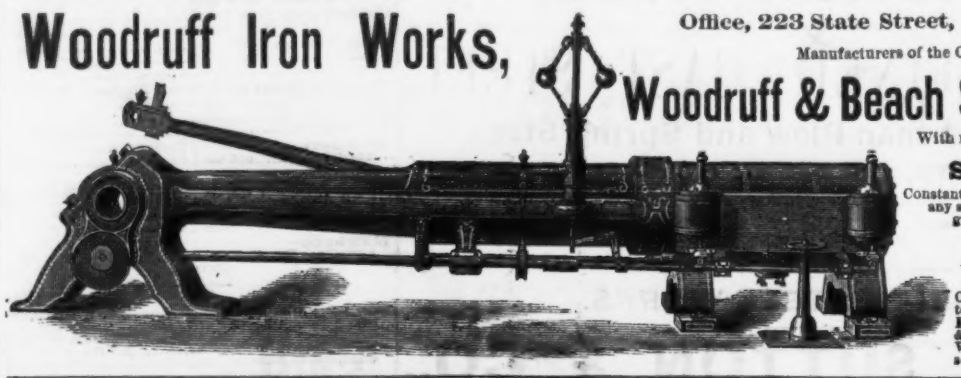

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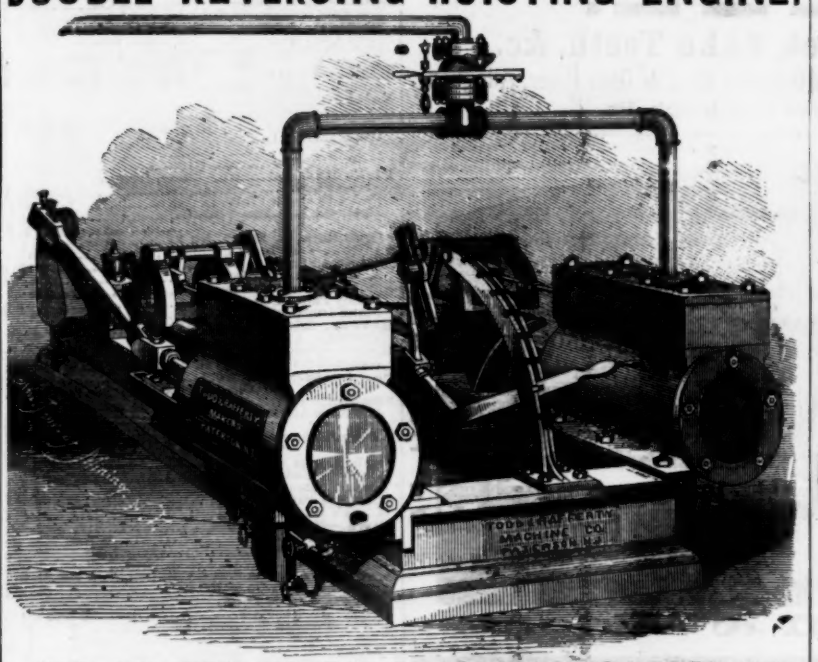

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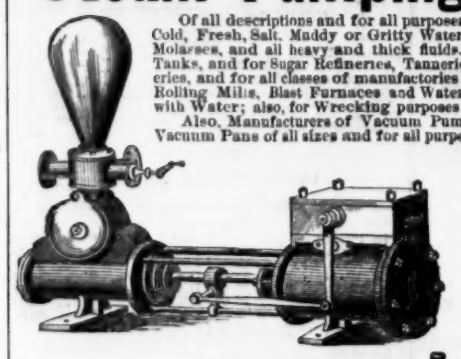
Steam Pumping Machinery



Of all descriptions and for all purposes, of any proportion or size, for pumping Hot, Cold, Fresh, Salt, Muddy or Gritty Water, Grain-mash, Syrups, all kinds of Beer, Acids, Molasses, and all heavy and thick fluids. Also for Feeding Steam Boilers, Supplying Tanks, and for Sugar Refineries, Tanneries, Oil Refineries, Gas Works, Hotels, Breweries, and for all classes of manufactories; for Draining Mines and Excavations, and for Rolling Mills, Blast Furnaces and Water Works supplying Cities, Towns and Villages with Water; also, for Wrecking purposes and Steam Fire Engines for Land and Sea.

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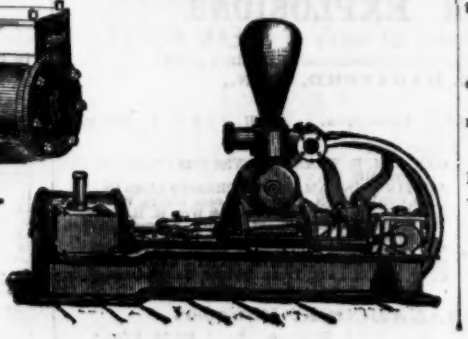

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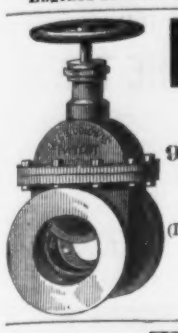

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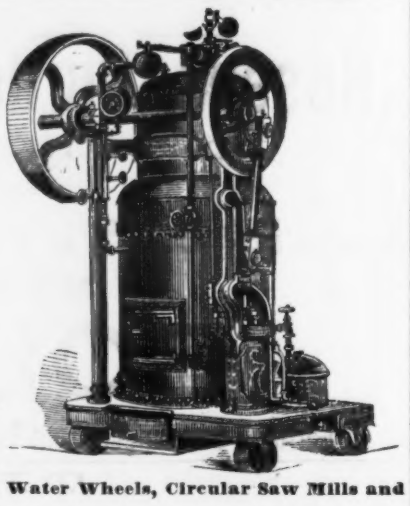

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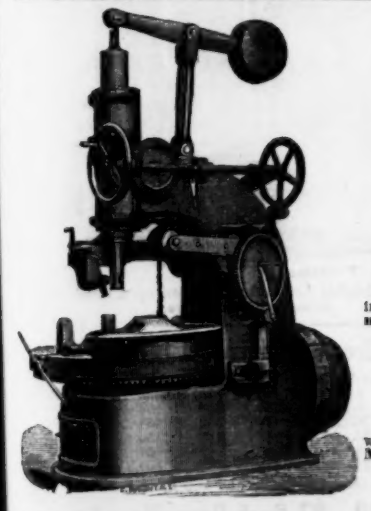

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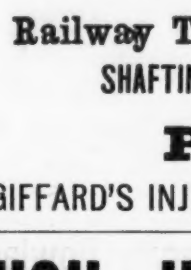

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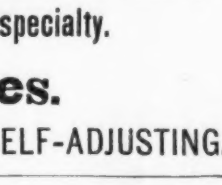

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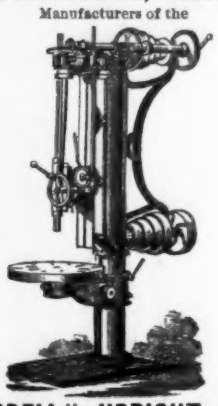

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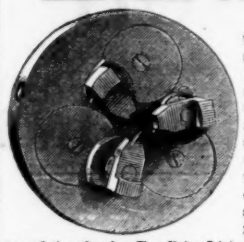

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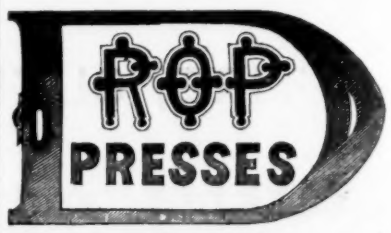

Bennett Hotchkiss and N. C. Stiles' Patent.

This Drop (which has been illustrated in this journals of that class in which the Hammer is raised by a stiff belt or board passing up between two friction rolls, and is so well known that we will only describe our improvements. The patents we are working under are those of BENNETT HOTCHKISS (who in an interference case with Goulding and Cheney was declared the first inventor) and N. C. STILES. Our improvements consist:

First.—Of an arrangement of parts that makes it the most complete Jobbing Hammer, and will take the place, to a great extent, of all other kinds for forging. In addition to the upright rod, which is operated by the hammer to open and close the rolls, we place another rod the lower end of which is secured to the end of a lever which is operated by the hand or foot, which operation also opens and closes the rolls at will. The lower end of this rod has a slot, so that the action of the hammer will not disturb the hand lever, thereby preventing the hand being injured, as otherwise would be the case.

Second.—No dog is used on the upright to hold up the hammer. The belt or board passes up between two clamps situated under the rolls, so arranged that as the hammer ascends they will freely open of themselves, but on descending they will close and hold up the hammer. To let the hammer fall the clamps are opened by pressure upon the foot treadle.

Third.—The board or belt is secured to the hammer by an elastic connection, which prevents the sudden jar and destruction of the same. The back roll is made adjustable to different thicknesses of board or belt, as also are the clamps. An adjustable collar on the upright rod allows the operator to obtain *any hight* of blow desired automatically. If one blow is wanted, press upon the treadle and remove the pressure as soon as the blow is given. Keep the foot upon the treadle and the blows will be repeated until the pressure is removed. If a blow of less hight than the collar is set for is required, work the hand lever, which will give you any hight of blow desired. The hammer can be held up at any point below the collar by bringing the hand lever into action when the hammer is at the desired hight, so that the next blow can be given from a state of rest, of less hight than the collar is set for. This is a feature no other drop has; that is, the first blow struck can be of less hight than the second or third, and obtained from a state of rest. A gentle pressure upon the treadle will allow the hammer to go down slowly, but it will stop and remain suspended at any point as soon as the pressure is removed.

The clamps in holding up the hammer keep the board from touching either roll and prevents the same from being worn uneven.

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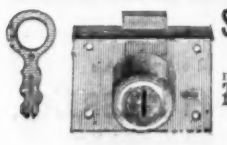

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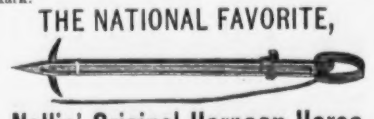

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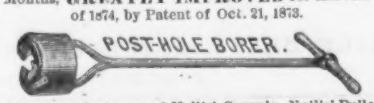

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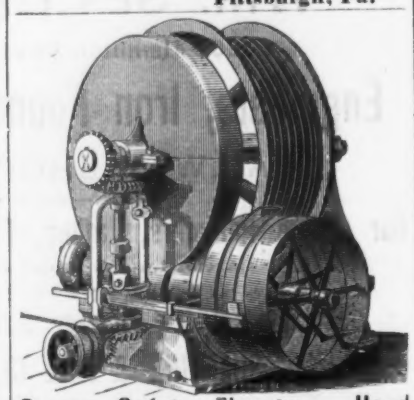

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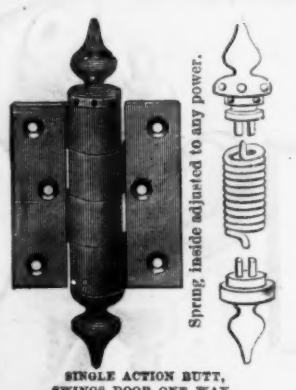

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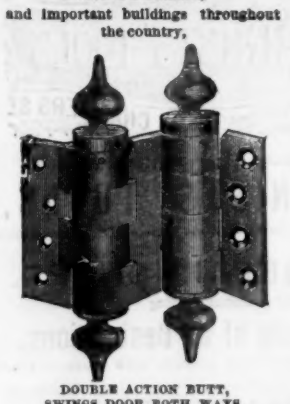

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